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THE RADICAL OPERATION FOR THE CURE OF CHRONIC SUPPURATION OF THE ANTRUM OF HIGHMORE, SPHENOID SINUS AND ETHMOID CELLS. *

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The necessity for operative procedures in diseases of at least one of the accessory sinuses of the nose was recognized by LeMourier as far back as late in the eighteenth century, when he devised an operation for draining the antrum of Highmore. Since that time various surgical measures for the relief of suppuration in the accessory sinuses of the nose have been devised; but it has only been since the pathological anatomy of nasal suppurations has been understood, that radical surgical measures have been undertaken to drain and permanently cure the annoying disease of chronic multiple nasal sinusitis.

For the cure of chronic suppuration of the antrum, it is interesting to note how, almost contemporaneously, yet independently, Caldwell, Jansen and Luc departed from the Cooper, Mickulicz and Küster operations and resorted to a free removal of the anterior wall of the antrum in the region of the canine fossa, together with a large opening through the nasal wall of the antrum into the nasal cavity. This operation was a decided advance, and largely through the broad field of operation afforded by it our knowledge of the

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clinical pathology of neighboring parts was materially increased. Jansen, I believe, was the first to take advantage of the knowledge thus gained, and applied it to the endeavor to make a radical cure by removing all diseased tissue that he could reach through this opening; frequently extending the field of his operations into the remotest ethmoid cells and sphenoid sinus, when these cavities were found diseased.

It is not my intention to discredit any of the less radical operations mentioned, for each has its place in surgery. It might be remarked as an instance of this, in passing, that the Cooper is the operation *par excellence* for acute suppuration of the antrum of Highmore of dental origin; while the Mickulicz operation is sufficient for the cure of many cases of acute or subacute infections of the antrum of nasal origin, from such a disease as La Grippe. It is too much, however, to expect a cure by means of these operations, or of the Küster, or even of the Caldwell-Luc operation, where the antrum of Highmore is diseased as a result of or in connection with chronic suppurative conditions of one or all of the other accessory sinuses of the affected side. It was for the relief of these last conditions, viz., chronic suppurative disease of the antrum of Highmore, ethmoid cells and sphenoid sinus, that the operation to be described was devised. I have performed eleven radical operations on ten patients for the relief of these latter conditions. Some seven or eight of these cases have been shown before this section at various times, including this evening: but because of the limited time allowed this paper, I have selected the following case to illustrate the operative technique and to exploit the results attainable by it, even when under apparently unfavorable conditions:

Mrs. —, 72 years old, was presented for examination late in May, 1903, by Dr. A. M. Campbell, whom she had consulted for a right-sided trifacial neuralgia from which she had suffered for more than thirty years. This neuralgia was paroxysmal, and always, of late years, accompanied by severe pain in the vertex and occiput. When 40 years of age she had all of the teeth extracted from the upper and lower jaws, because of their decayed condition and in the vain hope of relief from her pain. Ten years ago she had had severe pain, with abscess formation in the right upper alveolus. This was relieved by the removal of several pieces of diseased tooth root from the site of the molars on the right side. She is uncertain about the character of her nasal discharges, but has had a nasal catarrh and odor for many years. Six years ago she was operated on by the Cooper method with drainage tube. This opera-

tion was performed by a general surgeon, who did not treat the nose, but placed all of his reliance on cleansing through the tube. The patient carried a tube for six years and douched herself thrice daily during this period. Examination revealed a silver tube projecting from the wound in the alveolus in the location of the first molar tooth, the tooth being absent. The tube was filled with pus, and its removal was followed by an oozing of pus through the fistula. The nose presented a fairly normal-appearing, somewhat small inferior turbinate. The middle turbinate was slightly enlarged, its anterior and inferior borders were infiltrated with edematous (myxomatous appearing) masses. There was no contact with the septum, but the diseased tissue evidently extended into or from the region of the osteum, as the whole visible portion of the hiatus semilunaris was similarly affected. A slight amount of pus was seen on the floor of the nose, in the region of the osteum and in the nasopharynx. Probing in the antrum set up such a paroxysm of neuralgia that this procedure had to be discontinued before any definite knowledge could be gained. Trans-illumination showed the right antrum only slightly dark; the left antrum light, and both frontal sinuses light. The patient was greatly distressed by her paroxysm of pain and demanded some sort of relief at any risk; but it was with much trepidation, even after the sanction of her medical adviser, that I consented to operate, and performed the following operation under ether anæsthesia in the Manhattan Eye and Ear Hospital, on June 25, 1903:

The jaws were held apart by a mouth-gag, inserted on the left side. The right choana was tamponed by a post-nasal tampon of cotton. To prevent blood reaching the pharynx from the mouth, a gauze sponge was held by dressing forceps between the jaws and the right cheek at the juncture of the posterior ends of the upper and lower alveoli. The cheek was retracted by a blunt retractor held by an assistant. The tongue gave much trouble by falling backward, and was held forward by a silk ligature passed through it. An incision extending from the posterior end of the alveolus to the anterior border of the canine fossa was made through the mucous membrane periosteum, just below and parallel with the attachment of the cheek. A periosteal elevator was then used to free the anterior and lateral convex surface of the antral wall from its periosteum and soft parts. The bleeding was not profuse and was controlled by pressure with gauze. The antrum was opened by a chisel sufficiently to allow of the use of a rongeur, which was then used to remove the outer wall of the antrum, anteriorly to its junction

with the internal wall, inferiorly to the floor, superiorly almost up to the infra-orbital canal and posteriorly along the external wall to just behind the anterior border of the masseter muscle. This part of the operation was nearly bloodless until the lining membrane of the antrum was wounded. This membrane was then incised and found to be in a state of myxomatous degeneration throughout its entire extent, excepting on the floor, where there was much granulation tissue bathed in pus. The internal end of the fistula resulting from the Cooper operation was marked by a large mass of granulations. The antrum was one large cavity, free from partitions; its *external angle* was well marked and lodged much myxomatous tissue and pus. The osteum was large, a half inch long by a quarter inch broad, and filled by myxomatous masses. After completely removing the lining of the antrum with a large, sharp curette, the bony internal or nasal wall was removed, anteriorly to the junction with the external wall, posteriorly to its junction with the posterior wall, and inferiorly to the floor of the antrum with the same instrument. The superior part of this wall, which is formed by the external wall of the ethmoid cells, was necrotic; it was removed with the sharp spoon, as were all of the ethmoid cells and also the midddle turbinate. The whole region was filled with myxomatous masses, granulations and pus. A superior turbinate process was present, and was removed. The opening to the sphenoid sinus was plainly visible and was marked by granulation tissue and pus. A large part of the anterior wall of the sphenoid was removed to its floor with a sharp curette, as was the granulation tissue lining the cavity. During these various procedures the cavity was frequently dried with gauze soaked in 1-1000 adrenalin solution, which effectually controlled the hemorrhage, which at times was quite troublesome. Owing to the extensive disease, the upper part of the membranous wall was destroyed, but its lower two-thirds were preserved intact. The inferior turbinate bone was freed from its membrane piecemeal, both with the rongeur and with the sharp spoon, leaving the mucous membrane in a long strip attached anteriorly and posteriorly. This procedure was facilitated by the insertion of the small finger into the naris, which afforded counter pressure. After the wound was thoroughly cleansed, the remnants of the nasal mucous membrane, consisting of fairly normal tissue from the inferior turbinate and from the lower two-thirds of the nasal wall, were utilized as follows: That remaining from the wall was freed from its anterior attachment and was drawn into the cavity of the antrum, covering in large part the posterior wall and part of the floor. It was anchored by a stitch to the superior lip of the wound

in the mouth, near its posterior end. The mucous membrane of the inferior turbinate was divided at the posterior end of its anterior third, and the posterior flap thus formed was placed along the floor of the antrum and anchored by a stitch to the inferior lip of the wound; while the anterior flap of turbinate mucous membrane was anchored by a stitch in a similar manner, and made to cover around the corner of the anterior exposed bone, *i. e.*, the bone forming the apex of the "anterior angle." The result was that the lower and posterior part of the antrum was fairly well lined with a functionating mucous membrane. The roof was nearly bare; but this space was not large. The whole wound, from the interior of the sphenoid sinus to between the lips of the oral wound, was packed with iodoform gauze. The oral wound was not stitched. The operation occupied only one hour, and the patient was put to bed in good condition, requiring no stimulation. She passed a quiet night, presented no symptoms of shock, and did not complain of pain. At no time following the operation did her temperature exceed 100° F. Her first dressing took place three days after the operation and caused only slight discomfort and only slight neuralgia. She was discharged from the hospital on July 9th—fourteen days after operation—and had the dressing permanently removed two days later, with instructions to douche the wound and nose after eating. In this connection it is interesting to note that she replaced her false teeth before the first dressing was removed. This added greatly to her comfort. The mucous membrane flaps from the nose prevented the closure of the oral wound and permitted a free inspection of the cavity during the process of healing. In the lower part of the antrum this took place rapidly, and apparently was complete at the end of two weeks. The healing in this region was hastened by applying ortho-chlor-phenol to the little ridges of granulation tissue that sprang up between the mucous membrane flaps. For a month there was a tendency to excessive growth of granulation tissue on the posterior superior wall and about the floor of the sphenoid. This was cauterized with ortho-chlor-phenol, and was sufficiently well healed at the expiration of six weeks form the time of operation to allow the patient to take a long journey. She was instructed to use an alkaline douche, to be followed by the insertion of an ointment of menthol, eucalyptol and vaseline. She did well until late in September, when she had a return of her "tic," and my assistant, Dr. McCullagh, who had charge of the patient during my vacation, reports that there was pus exuding from the granulations in the sphenoid, with a small polypus attached at the junction of the anterior wall with the floor of this sinus. This he removed and applied

ortho-chlor-phenol freely to the granulations in the sphenoid. I saw the patient the first of October and found her nose free from pus, although the granulations in the sphenoid appeared soft and unhealthy. There was a beginning acute dacryocystitis on the right side. This cleared up in a short time, and the patient since then has been almost completely free from pain; has no nasal discharge other than mucus and feels herself in good condition. She will not allow the closure of the oral wound, being fearful of a possible return of her symptoms. The wound, however, is contracting, and now permits the passage of only a small probe.

This case has been selected from others to illustrate the operation and its results for several reasons. The age of the patient was not favorable; the disease was long-standing and unexpectedly extensive; the sphenoid disease was not diagnosed before the operation; the symptoms were complex and the relief of the condition, although delayed, seems now to be complete. I expected the patient to be present this evening, but to-day she returned with severe occipital and vertical pain, and examination revealed pus exuding from a small fistula in the sphenoid with denuded bone on the posterior wall of this cell. That involvement of the sphenoid was unsuspected, together with the fact of the return of the suppuration in it, is interesting, and to me proves the necessity of a large and free field, not only for diagnosis and possible operation, but also for future observation and possible treatment.

The operation is described in detail because there seems to be a lack of knowledge of its technique, and in the hope that others may profit by the advantages it offers over the nasal route. There is a question of etiology that this case suggests, and that is, was a diseased tooth the etiological factor in this case, and were the ethmoid cells and sphenoid sinus secondarily affected, or was there originally an infective multiple sinusitis with sufficient involvement of the protruding tooth-roots in the antrum to cause disease of the roots, or at least causing the dentalgia? Another question is, Was her neuralgia, and especially the pain in the occiput and at the vertex, caused by the sinus disease, and is not the presence of occipital pain and pain at the vertex in cases of nasal suppuration symptomatic of sphenoid disease? The fact of a return of her vertical and occipital pain at the time of the return of suppuration in the sphenoid bears out this conclusion, as does my experience with many of these cases.

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TUBERCULOSIS OF THE LARYNX.

A Review of the Past Year (1903).

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The past year has been as usual, prolific in the literature of laryngeal tuberculosis, and there is here presented reference to 32 different original articles, appearing in journals within the reach of the writer. Of these, 10 are contributed by German, 9 by English, and 13 by American authors. In general the literature represents the advances made in diagnosis and treatment of this frequently fatal affection; but a new phase of the subject, laryngeal tuberculosis in pregnant women, has been the subject of original studies and will be taken up in its proper place.

For ready reference the matter will be treated under the following headings:

1. Primary tuberculosis.
2. Lupus.
3. Diagnosis.
4. Operative treatment.
5. Local, general, and other treatment.
6. Laryngeal tuberculosis and pregnancy.

PRIMARY TUBERCULOSIS OF THE LARYNX.

Tuberculous laryngitis may occur in any stage of the pulmonary affection, even before the physical signs of the pulmonary lesion are manifest, the so-called primary laryngeal tuberculosis. Sheedy[5] reports a case in which the larynx was involved for nine months and tubercle bacilli were found, before the lungs became affected. "Von Navratil[11] describes a case of four years' duration. Thomas[15] reports a case in which swelling and ulceration of the arytenoids and epiglottis were found before the physical signs in the lungs became manifest. Kelson[20] presented before the Laryngological Society of London a man of 55 years who had suffered from aphonia for six weeks. There were swellings of the epiglottis and ary-epiglottic folds, false and true cords, but no bacilli were found; the consensus of opinion of those present was that it was a case of acute laryngeal tuberculosis. Wingrave[24] reports a case of a woman of 40 years who suffered from aphonia with swellings and ulcerations within the

larynx and cicatrices and infiltrations in the pharynx and soft palate. The case was possibly one of lupus. McKinney[2] reports a case of laryngeal tuberculosis secondary to tuberculous cervical glands.

LUPUS.

Lupus of the larynx is occasionally a primary affection, and as in lupus generally, is followed by general tuberculous infection. Weisinger[19] reports a case of fourteen years' standing. Harris[22] reports a case in a woman 73 years old. There was evidence of pulmonary involvement, but no tubercle bacilli were found. Dr. Jonathan Wright had seen the case three years before, and made the diagnosis by microscopical examination of a piece removed from the epiglottis. The lungs at that time were normal. Wingrave[26] had a patient who had ulcerated nodules along the upper edge of the epiglottis, without involvement of the rest of the larynx. The lungs were normal and no bacilli were found.

Fraenkel[17] demonstrated pathological specimens of two cases of lupus; the one a case involving the nose, septum, pharynx, and larynx, and the other a case involving the hard and soft palate, uvula, epiglottis, and the larynx as far down as the vocal cords.

Miller[3] reports a case of lupus involving the entire entrance of the larynx. The diagnosis was made by microscopical examination. The case was treated by X-rays with some improvement.

Chambers[1] reports a case which will be referred to later.

DIAGNOSIS.

McKinney[2] describes the earliest symptoms of laryngeal tuberculosis as:

(1) Persistent hoarseness which does not yield to ordinary measures.

(2) A sticking sensation in the region of the larynx.

(3) Dysphagia, with pain radiating to the ears.

(4) When these symptoms are accompanied by the general signs of tuberculous infection, such as emaciation, evening rise of temperature, and night-sweats, an examination of the larynx should be made by a competent laryngologist even if the physical signs in the lungs are normal.

The laryngoscopic appearances of early tuberculous laryngitis have been described by Chappell[20] as follows:

(1) The premonitory or pre-tubercular stage.

(2) The stage of infiltration or thickening.

(3) The stage of ulceration.

During the time before the appearance of definite laryngeal symptoms there appears in tuberculous subjects an extreme pallor of the soft palate, pharynx and larynx; but this is expressive of the general anæmia and not of the beginning of the tuberculous process. On the contrary, the laryngeal involvement begins as a recurrent and persistent hyperæmia or infiltration of the larynx occurring diffusely or in circumscribed areas. Somewhat later ulceration appears, at first superficial. The favorite location for these lesions is in the epiglottis, the posterior third of the vocal cords, and the inter-arytenoid space. Persistent swellings in this region are always suspicious. The diagnosis is difficult, as the condition may occur before tubercle bacilli appear in the sputum, as in the cases reported by this author and by Kelson[30].

The granulation tissue in the posterior commissure may become exuberant later in the disease, forming the so-called "tuberculous tumors," as in the cases of Pick[12] and von Navratil[11].

OPERATIVE TREATMENT.

The treatment of laryngeal tuberculosis has received much attention during the past year, and the writers generally assume a very conservative attitude in regard to operative interference.

The indications for operation have been set down by Kronenberg[9] who believes that the condition of the patient's lungs is of the first importance. A severe laryngeal tuberculosis in a patient with mild pulmonary symptoms and good general health admits of a better prognosis from operative interference than a beginning laryngeal tuberculosis in a patient with severe phthisis and poor general health. He further states that tuberculous tissue should be removed from the larynx only when the whole infected area can be excised. Laryngotomy for this purpose is indicated only when the infected parts are inaccessible by the intra-laryngeal method. Operative interference is justified when threatening complications supervene, e. g., interference with respiration.

Kronenberg does not admit the specific or selective action of any chemical caustic, and thinks that the galvano-cautery will soon be recognized as the best means of cauterization. The general dietetic and hygienic management of the patient is of the most importance to assure the success of operative interference. In accordance with these indications Kronenberg would limit operative interference to tuberculous tumors, and isolated tuberculosis of the epiglottis; he does not remove tuberculous swellings, but if ulceration is already present the tuberculous area may, under proper conditions, be ex-

cised; he would sometimes take advantage of a compulsory tracheotomy to extend the incision upwards and perform laryngofissure.

In contradistinction to these strict limitations, Lockard[8] has succeeded in relieving the sufferings of the more advanced cases by the following procedures:

(1) Division of the posterior commisure in the median line under cocaine anæsthesia with a pair of angular scissors. Rectal feeding for one week if necessary.

(2) Division or removal of the epiglottis.

(3) Tracheotomy.

(4) Laryngofissure.

Price Brown[16] performed tracheotomy for stenosis caused by tuberculous infiltration. After some difficulty with the tube had been overcome the patient improved locally and gained in weight. The only local treatment consisted of spraying with menthol-albolene.

Von Navratil[11] is a case of primary tuberculosis performed tracheotomy for stenosis and then excised, endolaryngeally, part of the ventricular bands and inter-arytenoid space. The patient wore the tube for six months. Later a tuberculous tumor was removed from the left ventricle.

Pick[12] removed a pedunculated subglottic tumor, with the autoscope; the tumor had caused considerable dyspnœa, and the patient was in very bad condition at the time. The pulmonary condition was very much benefitted as a result of its removal.

Lake[29] removed a half-inch-thick, ulcerated epiglottis for dysphagia, with the galvano-cautery snare. The pain was relieved at once, the wound healing in four weeks.

Chambers[1] removed an epiglottis for lupus. The operation was performed with some difficulty under general anæsthesia. The subsequent removal of a remnant of the stump under local anæsthesia demonstrated the advantage of this latter method.

Gruenwald[14] suggests the use of the galvano-cautery point to destroy deep infiltrations and large swellings. One or more punctures are made. This little operation is followed by no pain and slight reaction, and shrinkage of the parts is said to be marked.

LOCAL, GENERAL AND OTHER TREATMENT.

With the passing of the curette and ring-knife, the use of local applications has multiplied. Their number has become legion, and each has its advocates. Applications may be made by inhalation, spray or intra-tracheal injection.

Imhofer[18] has arranged these as follows:

(1) Antiseptics, to remove secretion and stimulate granulation: Iodol; boric acid; iodoform; resorcin; a mixture of iodoform, 1 part,

and resorcin, 2 parts; formalin; creosote; pyoctanin; aristol; a mixture of lead acetate, 1 part, and milk sugar 10 parts; bismuth subnitrate; thiocol with boric acid and cocaine; alumnol; thioform; nosophen; soziodol salts.

Menthol deserves special mention on account of its antiseptic, anæsthetic and emollient properties. A twenty per cent solution in olive oil can be used as injection, inhalation or spray. It may be combined with orthoform, according to Freudenthal's formula.

(2) Substances which reduce congestion: Adrenalin; orthoform; cocaine; eucaine, antipyrin in 25 per cent solution.

(3) Inhalations which loosen expectoration but have no curative powers.

Turpentine; oil of Pinus Pumilio; oil of eucalyptus; pix liquida; creosote; alum; opium; cherry-laurel water; lingo-sulfite; igazol.

(4) Caustics which destroy tuberculous tissue and leave a protective scab over the ulcerated surface: Chromic acid; ortho-para-achlor-phenol; carbolic acid; 10 per cent carbol-glycerine; 50 per cent hydrogen peroxide; liquor ferri sesquichloridi 4 to 30; a mixture of B-naphthol, 1 part and camphor 2 parts; phenol-sulphorhizin; galvano-cautery. The latter must be used carefully on account of the swelling which is apt to follow. The use of a solution of methylene-blue is said to prevent this swelling.

Imhofer accords a high place to lactic acid. He repeats the original recommendation of Krause, i. e., to use the lactic acid after thorough curettement, and states that the latter now uses a 20 per cent to 50 per cent solution in alcohol. He urges the importance of general treatment and mentions the use of cinnamic acid (Krause) and tuberculin (Adler).

Wingrave[28] reports improvement from intra-tracheal injections of guaiacol, in a case with ulceration of the false and true cords on both sides and œdema of the commissure.

Sharp[4] recommends the use of internal medication alone in the mild cases; the severe cases he sends to a high altitude.

Hamm[7] reports a number of cases successfully treated at the Armenius-brunne at Lipspringe, and claims specific action for the waters of this spring.

Bowditch[28] reports 79 cases of arrested pulmonary tuberculosis. In one of these cases the larynx was also involved, and the patient was reported in good condition after 12 years.

Miller[3] treated a case of lupus, referred to above, with X-rays, with some improvement.

Harris[22] in a more pronounced case, obtained no benefit from this means. In a discussion which followed Hoyt's paper[32] two cases of laryngeal tuberculosis were reported as having been treated with X-rays without result.

Freudenthal[23] is experimenting with the Finsen light, ultra-violet rays, etc.; his cases are few, and while the results have been encouraging it is yet too early to express definite views as to the value of these methods.

LARYNGEAL TUBERCULOSIS AND PREGNANCY.

Godskesen[13] in a masterly article on this subject, gives credit to Kuttner as the first to call attention to the very unfavorable prognosis in laryngeal tuberculosis in pregnant women. Of Kuttner's 15 cases, all but one of whom acquired the laryngeal tuberculosis during pregnancy, all died before or within two months after delivery. To these 15 cases, Godskesen adds 46 more, which he collected from literature and hospital reports.

Thirty-five cases were treated endolaryngeally; of these 23 died during pregnancy or within two months after delivery or abortion. Two cases were cases of tuberculous tumor; these were operated, and the women were afterward successfully delivered; eight other cases were successfully delivered; two cases passed, out of observation, before the termination of the pregnancy, "in good condition."

Eleven cases were treated extra-laryngeally; in eight of these tracheotomy alone was done, of which three died immediately after delivery or abortion and five were successfully delivered. In the remaining three cases laryngofissure in addition to the tracheotomy was done. One case, in the fifth month of pregnancy, recovered from the operation and passed out of observation; the other two cases died.

Nearly all the children that were born died in early infancy.

Laryngeal tuberculosis occurs three times as often in men as in women, and as the women are generally in very poor health, few of them become pregnant. Nevertheless pregnancy predisposes to tuberculous laryngitis and may even cause a recurrence of an apparently healed tuberculosis of this organ. Two-thirds of the cases reported by this author began during pregnancy.

The course of the disease is rapid and fulminating. The laryngeal symptoms soon become the dominant factor in the patient's condition.

Godskesen advances the opinion that abortion should be done in the first half of pregnancy when the general condition of the woman is good and as soon as the larynx shows the slightest tendency to

become worse. In the more severe cases, in the last half of pregnancy, in rapidly progressive cases, and where there is much dysphagia, tracheotomy should be done. He advises not to wait until threatening suffocation makes the operation imperative (sudden stenosis may occur at any time in these cases), but to perform the operation as early as possible.

Lohnberg[21] reports 7 cases of laryngeal tuberculosis in pregnant women. He believes that the diminished vitality due to indisposition to out-door exercise, the anorexia, dyspnœa, and over-taxed heart action, causing an impoverished condition of the blood, and in addition the fact that a relation exists between the pelvic organs and the upper respiratory tract, are sufficient to explain the particularly baneful effect which pregnancy exerts upon the larynx of a consumptive woman. Not only does simple catarrhal laryngitis show an increased tendency to become tuberculous, but an already existing tuberculous laryngitis makes rapid and alarming progress as the pregnancy advances, and a fatal termination before the end of pregnancy is to be expected. Under these circumstances the question of abortion becomes of paramount importance. The question here differs somewhat from the same condition when the lungs only are the seat of the tuberculous infection; for a woman with a quiescent pulmonary tuberculosis might be permitted to go through a pregnancy and give birth to a child, while in the case of a very sick consumptive woman, timely abortion may be the only means of prolonging life. A severe case of laryngeal tuberculosis, however, makes such rapid strides after pregnancy has become established that an attempt at abortion would probably hasten the lethal outcome; two lives would be sacrificed to prolong one hopeless one. But a beginning case of laryngeal tuberculosis in a woman whose general health is fair, presents an aspect by no means hopeless, so long as she does not become pregnant. She should not be permitted to do so; if she does, the induction of abortion becomes imperative.

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MIDDLE TURBINAL HYPERTROPHY AS A CAUSE OF HAY FEVER AND OTHER DISTURBANCES, NASAL AND OTHERWISE.

BY EDWARD J. BROWN, M.D., MINNEAPOLIS, MINN.

The vicious character of the hypertrophied middle turbinal has been extensively exploited during the past few years, and some very convincing papers written.

My only criticism on most of these papers is that there has seemed to be a tendency toward assuming proprietorship in the discovery of middle turbinal turbitude, which hardly seems justifiable, in view of the papers published by Lefferts, Bosworth and others, more than a dozen years ago. Bosworth's book published in 1889 certainly indicates that he had been snaring middle turbinal hyperthrophies for the relief of hay fever, and while he probably did not at that time fully appreciate the significance and overwhelming importance of contact between the middle turbinal and adjacent mucous surfaces, he would be justified in a quiet smile at some of the late papers.

Beginning special practice in the fall of 1889, soon after the publication of Bosworth's book, I was impressed with the reasonableness of his views, and tried to follow them in my work.

Very early in my examinations of the nasal chambers I was impressed with the fact that accurate information of nasal conditions was practically impossible to men who examined patients at arm's length and with the cumbersome condensers and inefficient specula mostly in use. With carefully focussed light from an Argand burner I found that the anterior part of the middle turbinal was in practically all cases presenting nasal or throat symptoms, enlarged and more or less in contact with the septum or outer nasal wall. It did not require the mind of a Newton to recognize the perfectly obvious fact that such contact between surfaces teeming with sensitive nerve filaments might be the source not only of local irritation, congestion and obstructive hypertrophy, but as well of more or less remote reflex disturbances. Consequently I began to reduce such hypertrophies by chemical cauterization, or if the patient would consent, by the cold snare. My first operation was done in December, 1889, and was very badly done. Following the customary practice, the loop of a snare was placed around the growth and the wire gradually tightened till the desired object was accomplished. Of course the wire slipped to some

extent, allowing part of the growth to escape and as always happens with that sort of snaring, a ragged stump was left, and as the growth unfortunately happened to be highly vascular, a severe hemorrhage resulted, to the great disgust of my patient. The relief from the operation, bad as it was, satisfied the patient and no examination was made for two years, at the expiration of which I found a small growth which was at once removed with the underlying tissues, including the bone. No microscopic investigation was made but I am confident that the growth was an angioma, the only one I have ever met with in the nose. In doing this later operation I used the Bosworth snare with a home-made modification of my own, which I have been vain enough to believe, makes it the best type of snare in use for this particular purpose. The modification consists of a loop of No. 8 piano wire securely and permanently adjusted and just long enough to serve as an eye, into which a short loop may be threaded. If the end of the loop be compressed sufficiently (without heat) it will pass through the canula and permit the loop to be threaded with ease. Such an arrangement is stronger and in my opinion far superior to that of Sajous, and if broken can be replaced in five minutes. The device is so simple that probably many others have employed it. One great advantage is that the loop to be used in snaring can be made of the desired size and shape and bent in the desired position with entire confidence that it will stay as placed.

In the case in point as in all similar cases, the loop was *bent down,* adjusted over the growth, the end of the canula pressed firmly above, and the loop drawn home with a quick motion and the combined force of the two hands. In 484 resections of the middle turbinal not more than a half dozen have failed to be easily and instantaneously cut through, and in the great majority of cases with the use of no other instrument. In a few cases of course the anterior attachment must be severed with saw, scissors or cutting forceps, and the loop applied as conditions may require. No man who has once used this method will ever again resort to the ratchet snare or the even more brutal method of tearing the body away with forceps.

Formerly I used no other dressing than an anterior plug of cotton, but after a severe hemorrhage in case of a middle aged woman I adopted the plan of inserting a piece of gauze two inches square soaked in melted petrolatum, the naris being later packed lightly with a strip of gauze which is removed by the patient on the following morning and the small pack left till the patient comes to the office on the second day. In many cases of catarrhal troubles in the nose and throat the removal of anterior middle turbinal hypertrophies has

been practically the only treatment required. No ill result which could reasonably be attributed to the removal of such growths has ever occurred in my practice.

Few nasal operations are followed by such brilliant results as are often met with here. For example—S. B., a middle aged nurse had suffered for several months from a severe and uncontrollable cough. A large soft hypertrophy based upon a bony enlargement of the left middle turbinal and occupying the exaggerated space resulting from a right deflection of the septum, was snared.

Two months later she reported that she had not coughed once since the operation. In two cases painful eyes with symptoms of subacute glaucoma, which had resisted treatment by eserine and other conservative means, at once became quiet after the removal of a middle turbinal growth which was pressing upon the septum.

In a widely distributed paper on Hay Fever a distinguished local writer intimated that in such operations only the soft parts should be snared, and that any resection of bone was unjustifiable.

My own practice has been to remove a part of the bone in nearly all cases, and while I have sometimes regretted that I had removed quite so much, the regret has been perhaps quite as often that more had not been removed. Hay Fever has not been a frequent complaint with my patients, probably because most of them are too poor to indulge in such a fashionable luxury, but there have been a few cases, mostly physicians or members of their families. In such cases there has always been so far as I can remember, some abnormality of the middle turbinal of one or both sides of the nose and the only treatment that has afforded me any marked satisfaction, has been small applications of chromic acid or resections of the offending hypertrophies. I have never hesitated to do either in appropriate cases during the attack, though patients are of course advised to have such treatment in the quiet period.

I am unable to say that any of my cases have been cured, but they have been greatly relieved in most cases, and some might perhaps have been cured had they submitted to treatment as advised. Some years ago a young man just out of school and attached to a surveyors' field party, was so severely attacked with hay fever that he was unable to do his work. The greatly swollen right middle turbinal was at once resected and with the aid of supra-renal extract the young man was able to go on and complete his summer campaign.

On August 28, 1902, Miss E. M., 38 years old and who had suffered from hay fever for 18 years, came to me with an acute attack.

She had been skillfully treated by two former consultants, one of whom had removed the head of each middle turbinal, while the other had removed septal spurs and cauterized sensitive points, as a result of which her attack was less severe than former ones. After a thorough use of cocaine and adrenalin chloride I found a small point of contact of each middle turbinal with the septum. These points were removed as well as possible under the conditions present, with cutting forceps.

The next day she was greatly better and had little further trouble. Late in the hay fever season this year this patient came and informed me that she had had a light touch of her old trouble, but not enough to require treatment.

W. B., 13 years old, son of a prominent physician, has had hay fever for several years, for which I have removed the offending parts of the middle turbinals with decided relief. At the beginning of this summer's vacation he was sent to the woods of northern Minnesota. Returning August 26 he had an attack of mild character that night and continuing till the 28th when I removed a small broad based polyp from the infundibular region of the left naris, touching the base with trichloracetic acid, after which there was no further trouble.

We shall all most healtily welcome the perfected hay fever antitoxine, which is promised as the result of the brilliant researches of Professor Dunbar of Hamburg, but it is exceedingly doubtful if antitoxine or any other local or systemic medication will ever render unnecessary the intelligent surgical treatment of most of these cases.

39 Syndicate Block.

Demonstration of the Employment of Paraffin in the Correction of Nasal Deformities.—WALKER DOWNIE.—*Glasgow Med. Journ.*, July, 1903.

Downie again reports a series of cases of deformity of the nose treated by paraffine injections. He has improved his technique and now uses a mixture of hard and soft paraffin, giving a melting point of 106 degrees F. The needle is kept warm by means of a coil of platinum wire wrapped around it and transmitting an electric current which is regulated by a rheostat before the needle is withdrawn. Cold sterilized water is poured over the skin so as to hasten the setting of the paraffin and prevent its escape through the puncture.

A. LOGAN TURNER.

PIPE SMOKERS' ULCER OF THE HARD PALATE.*

BY ADOLPH RUPP, M.D., NEW YORK.

The clinico-pathological conditions of the palate, both hard and soft, are not only not numerous, but comparatively rare occurrences. One may take up treatise after treatise on diseases of the upper respiratory tract, and even those especially devoted to diseases of the mouth, whether they have been compiled by physicians, surgeons, or dentists, and not find anything said on the subject of this paper, namely, Pipe Smokers' Ulcer of the Hard Palate. All this only proves that the lesion to which attention is directed in this paper is very rarely serious enough to cause the patient to seek medical opinion or advice; and, therefore, the writers of special text-books are not to be charged with carelessness in having overlooked what they should have taken notice of and described.

In the course of about twenty-five years of general and special practice, which necessitated looking into and examining many mouths, I have rarely found the hard palate the seat of ulcerative disease due to pipe smoking or other causes. When we consider the very common practice of pipe smoking it seems remarkable that these ulcers are not seen often.

CASE 1.—A clergyman, about fifty years old, an arduous student, and an intemperate smoker of the pipe. The gentleman is healthy, well developed, and a devoted and systematic pedestrian. He complains of nothing except the chronic ulcer on his hard palate. Aside from the occasional bleeding, slight in amount, from this ulcer, it troubles him much more psychically than physically. He had been told by his regular physician that the ulcer was cancerous in nature. The ulcer had been treated for some weeks with X-rays, etc., but with so little apparent benefit as to cause the patient to lose faith in the remedy, and to finally have suggested to him the advisability of consulting special advice. I found an irregular, somewhat eliptical, ulcer on the hard palate, opposite the second molar tooth, about one-half inch long and a little less in width, to the right of the middle line of the right half of the hard palate. The floor of the ulcer was clean, had a hard grayish white appearance, and of a fibrous consistency. When penetrated to the bone, the bone beneath felt normal and hard and smooth. The edges of the ulcer were red and

* Read at the meeting of the Charity Hospital Alumni Society, Jan. 1904.

vascular, and bled when meddled with. The surrounding mucous membrane was œdematous or infiltrated, smoky or pearly in appearance, and shaded off into healthy mucous membrane. From the borders of the ulcer striæ of congested capillaries extended to the second molar tooth, and towards the soft palate. Suction, incidental to the act of swallowing, gave rise to slight bleeding from the edges of the ulcer. No pain was complained of in the ulcer region. The patient stated that during the past five or six years he had noticed ulcers develop in the region of the present ulcer, at different times, and that they had always healed when he stopped smoking his pipe for a time. The present ulcer, however, had persisted for several months, although he had given up smoking his pipe, and despite X-ray and other treatment.

The patient wished to know whether or not the ulcer was a cancerous manifestation. I assured him that the ulcer was not a cancer or an epithelioma; but a simple traumatic ulcer due to tobacco pipe smoking, and occasioned by his short briarwood pipe, and the mode in which the pipe was held in his mouth. I asked Doctor Bryson Delavan to look at the ulcer, and he also decided that the ulcer was not an epithelioma.

CASE 2.—A healthy and hardy mason, 53 years old, and a man who smoked a stub of a clay pipe all day long. The ulcer on this man's hard palate was opposite the right canine tooth. It was about half the size of the ulcer on the clergyman's palate, and quite circular; but tissues round about the ulcer were less congested and infiltrated, and there were no capillaries radiating from its edges. This man also feared that he had a cancer.

An epitheliomatous ulcer presents somewhat indurated edges; and, owing to the irregular growth of the corium, its surface is frequently papillated and villous. Besides it is usually an unclean and foul ulcer, accompanied by an enlargement of the neighboring lymphatics. All these malign characteristics were absent in both cases.

The location of these ulcers was determined, not by any personal tissue idiosyncracy, but by the manner the short pipe stems were held in the mouths of these smokers. The difference in the site of the ulcers was determined by the difference in the individual pipe stems, and the weight of the pipes, smoked by each of the men. The clergyman smoked a heavier pipe than the mason, and stuck the stem of the pipe deeper into his mouth than the mason found it necessary to do. These ulcers resulted, not from any friction of the end of the pipe stem rubbing the mucous membrane, but entirely from the thin hot current of tobacco-laden air venting its irritant force, remittently for months and months, against one par-

ticular spot of the wonderful mucous membrane of the hard palate, which finally melted away, slowly leaving an inflammatory chronic burn ulcer with a rather resistent fibrous floor.

Besides having been diagnosed as an epithelioma, this simple chronic tobacco-burn ulcer, in the mouth of the clergyman, had been suspected of being perhaps in some way connected with some suppurative process in the antrum. The antra had been examined with transmitted electric light; but what was found appeared to me to be the remains of what had five or six years previously been suppurative antral disease. The location of the ulcer did not militate against this suspicion, but the general character of the ulcer did. Treatment: Before consulting the doctor, both men had discontinued pipe smoking. They were advised to continue *not* to smoke. The treatment was altogether hygienic, and local.

1. The dentist was prescribed in both cases to look after the teeth, to remove tartar and to fill up cavities.

2. After taking food or drink of any kind the mouth was thoroughly rinsed with a simple salt solution, and the teeth were brushed.

3. To the ulcer was applied, by the patient, at intervals of two hours through the day, a solution of menthol in absolute alcohol (one drachm to the ounce).

The clergyman was seen late in September. On December 17th he wrote as follows: "I have perhaps been a little slow about writing to you as I promised. I have been waiting for the ulcer to get completely well, and to see if it promises to remain so. It continued to heal slowly but steadily till three weeks ago, when the process of healing seemed complete, and has shown no signs of return, but appears to become firmer with each week," etc.

The ulcer in the mason's mouth was the same sort of chronic tobacco-burn ulcer, only younger and less severe and extensive, and healed, under the same treatment, in less than two weeks' time.

359 West Thirty-fourth street.

THE SEPTUM NARIUM IN ABORIGINES AND THE CAUSE OF DEVIATIONS OF THE SEPTUM IN GENERAL.

BY W. FREUDENTHAL, M.D., NEW YORK.

It has always been my impression, and most likely that of others, that the septum of the nose in aborigines is usually straight and the deviations from the normal plane are the exception. This belief was based on the publications of many writers of former years. Thus Morell Mackenzie found amongst 438 specimens of *symmetrical* septa only 22.6 per cent belonging to Europeans; the others were Africans, aborigines of the American continent, of Polynesia, etc. This seems to speak strongly in favor of the above statement, so much the more so as Mackenzie himself had found in 2,152 other skulls which he examined not less than 1,657, or 76.9 per cent, with a more or less symmetric position of the septum narium. Zuckerkandl says that the ratio of symmetrical septa to asymmetrical ones is as 1 to 3. Among 370 crania of Europeans which he examined, he found the septum deviated 140 times, while in 103 crania of non-European races a deviation existed only 24 times. Although this material was not a large one, the difference between these two was so marked that Zuckerkandl became convinced that the symmetrical position of the nasal septum was much more frequent in non-European than in European races, or in other words, more common in aborigines than in highly cultivated races.

Later Bryson Delavan brought out further data which seemed to point "toward the fact that, among primitive types deformities are rare, while among types representing the highly civilized and luxurious they are of such common occurrence as to become almost the rule." Finally, to mention only one more observer, Paul Heyman of Berlin found among 250 nose patients, taken at random, not less than 241 with deviated septa. Such were the prevalent ideas on this question, and I had no reason to doubt them until I was led to examine the collection of skulls at the American Museum of Natural History in the City of New York. My findings I shall now give briefly:

The crania at my disposal came from aborigines from all over the American Continent, *i. e.*, from British Columbia down to

* Presented at the Western Section of the American Laryngological, Rhinological and Otological Society, at San Francisco, Cal., Feb. 26, 1904.

Mexico, including Arizona, Colorado and Montana and south as far as Peru and Bolivia. Altogether 1,164 crania were examined by me up to the date of writing this paper. 350 had to be excluded, as in these the septum was either missing or its shape unrecognizable; or, as in some instances, the condition of the skull was such that without destroying part of it one could not decide whether the septum was straight or not. These skulls were not macerated. After excluding these 350 crania, there were left 814 which were available for our statistics. It happened that among the first fifty skulls examined there was hardly an asymmetrical septum, but during further investigations they appeared rapidly, so that the total number of deviated septa amounted to 264; or, in other words, more than one-third of the septa showed a pathological condition. There were all varieties and shapes of disfigured and distorted septa to be seen in this collection. The most numerous were deviations in the anterior part of the bony septum; next came those in the middle part, while a deflection extending to the choanal end was quite the exception. Deflections of the cartilaginous septum naturally could not be noticed, since it was only in a very few instances that this part was preserved. The "S" shaped deviations were seen quite often. Furthermore, there were noticed ecchondroses and exostoses of the septum, which I mention here as they seem to have some bearing on the nutrition of these parts. I also noticed septa that looked like the sail of a ship, and others in which the diagnosis of a fracture of the septum was beyond doubt.

We must conclude from these findings that symmetrical septa are not, as was formerly believed, the rule in primitive types, but that they occur in a considerable number of instances (in our statistics in more than ⅓). Secondly, that all forms of distorted septa found in highly civilized people also exist in aborigines.

But all this does not bring us nearer to the solution of the question concerning etiology of these deviations. Different observers have "definitely settled" this question, only to have their views thrown overboard by others, and the problem is still far from being solved. Our first thought, naturally, is that deflections of the septum in these wild tribes was caused by traumatisms. This undoubtedly is the case in a goodly number of deviations of the cartilaginous and perhaps the anterior part of the bony septum. But it is difficult to believe, as has been stated before, that curvatures in the middle and posterior part of the septum could be of traumatic origin. That factor can also be eliminated in those cases in which the whole septum has the appearance more of the sail of a ship,

as Talbot called it, than that of a broken bone. We must, therefore, conclude that traumatism is not, in the majority of cases, the cause of deflected septa.

Nor can anyone affirm that the use of a handkerchief is a, or the, etiological factor in these wild tribes, as has been suggested to be the cause in civilized people. These races fortunately do not need a handerchief yet.

The same holds good of a third theory, the high arched palate theory, the untenability of which was shown by Talbot of Chicago. This view as you know, was of late ventilated largely in the medical press and it was believed that in the growing child the high arched palate crowded in the septum. The latter thus had no space to expand in, and grew crooked. Plausible as this appears to be, it is absolutely wrong, and Talbot, who examined thousands of skulls and palates, brings evidence enough to prove the incorrectness of the theory that the high vaults and contracted arches have anything to do with deviations of the septum.

The most plausible explanation, and one which I have held for a long time, is that given by Chiari in his excellent text book[1] on "Diseases of the Upper Air Passages." Most human beings are asymmetrical. This asymmetry is naturally most evident where both halves of the body join together, as in the septum of the nose. On the side on which the growth is strongest, more tissue will develop and a slight convexity will take place. This convexity, according to Chiari, will increase more and more until deflection results. In practice, however, I must say we often see things differently. The septum in its most convex part is sometimes as thin, I might say, as paper. This thinness is seen in both nostrils. Now in these cases, I imagine, the deposition of tissue must have stopped at some period and a rarefying process set in on the concave side. The result is the thinness of the septum.

As to the cause of the rarefying process in these instances, it is hard to give an explanation. But I believe it is caused like the other condition, the increased tissue building by the various human customs. Thus we see one arm, or leg, or side of the chest more strongly developed than the other. Why should not one side of the nose, through increased activity and respiration, build up more tissue than the other? This is the only explanation I can find for the occurrence of curvatures of the septum in aborigines.

The proportion of deviated septa was about the same whether the skulls belonged to races living on the coast or dwelling in the valleys or on the mountains, and irrespective of the occupations (fish-

ing or hunting) and customs (living in the open air or in caves) of the aborigines. In the civilized man, whose customs have so greatly multiplied, we may reasonably expect more deviations from the normal, and so it is. Now, habits may change, and a child that at one time was left-handed may gradually develop the other side equally or more. And I should not be surprised if that is the reason for the occurrence of a rarefying process on one side. On the other hand, if habits are kept up for years, this deposition of tissue will continue, the septum will grow thicker and more deviated and those bony or cartilaginous growths that we see so often on the convex side of the septum will also appear. These exostoses or ecchondroses are surely due to the same process of increased tissue building in consequence of increased development of one side.

In conclusion, I would express the belief that these constitute the etiological factors of deviations of the septum in most cases, except of course those where a fracture had been sustained, and I hope that future investigations along these lines will verify this theory.

A Case of Chronic Gangrene of the Pharynx —MERCIER BELLEVUE—*Semaine Médicale*, Aug, 25, 1902.

The author reports a case of a woman, æt 40 years, who developed, after an attack of influenza, an ulceration of the left tonsil; the left pillar became infiltrated, and the tonsil was invaded by a sort of nodular infiltration. By raising the tonsil, it could be seen that the gangrenous process affected the whole gland. A bacteriological examination showed the presence of a bacillus similar to that of noma. The disease lasted two months, during which time the general condition of the patient was fairly satisfactory. The author believes that it was not a case of angina of Vincent, but one of simple chronic gangrene of the pharynx. W. SCHEPPEGRELL.

A CASE OF OBJECTIVE TINNITUS AURI. *

BY ARTHUR I. WEIL, M.D., NEW YORK.

One of the commonest symptoms of patients suffering from ear disease, and perhaps the most annoying to the patient, often much more so than the loss of hearing itself, is the presence of persistent noises in the ear. This condition is present in a very large majority of all sufferers from disease of the ear[1]. In very rare instances it happens that these noises are not only subjective but objective as well, and can easily be heard by means of the otoscope in the ear, the stethoscope around the ear, or even by the unassisted ear of the observer when brought close enough to the patient. It is such a case which is to be presented.

The patient, M. G., female, 23 years of age, gives a negative family and personal history. Three years ago she noticed gradually increasing noises in the right ear, which have persisted up to the present time. There is no history of trauma or other known cause for the sound. She describes it as a roaring or a humming noise, variable in intensity, sometimes very loud, at others much diminished and occasionally momentarily disappearing. She has been treated more or less constantly for this trouble, but without appreciable relief. If we join her ear to ours by means of the otoscope we plainly hear a loud systolic murmur, synchronous with the heart beat, which often varies in intensity, even as we listen to it. Pressure on the right carotid greatly diminished the sound without, however, stopping it completely. Pressure on the left carotid is almost equally as efficacious in diminishing this sound. There is one point back of the ear, however (and this is perhaps the most interesting feature of the case) not far from the tip of the mastoid corresponding in position to about the location of the mastoid branch of the posterior auricular artery where very slight pressure causes a complete cessation of all the sounds. If we place a stethoscope over this point we hear the murmur more distinctly than at any other place; it is louder here than in the ear itself. There is, however, no localized swelling at this point and no indication whatever of aneurism there or elsewhere. Inflation of the ear by means of the Eustachian catheter, Politzer bag or Valsalva's method causes complete cessation of the sounds which reappear, however, immediately

* Read before the Harlem Medical Society, Jan. 6, 1904.

when the increased intratympanic pressure is equalized by swallowing or otherwise. Turning the head sharply to the right gives marked relief from the symptom. A constant moderate pressure on the vessels of the neck causes considerable diminution of the noises and consequent relief to the patient. For this reason she is in the habit of wearing high, tight collars, and she always feels better when so dressed. Nervousness or excitement of any kind makes the sound very loud and annoying, while physical and mental quiet causes like quiet in the ear. For this reason the use of bromides has given more relief than any other treatment. The hearing is unimpaired on both sides. The Weber is somewhat towards the right. The Rinné is positive, but the perception of the tuning fork is much diminished in duration. This is on account of the confusing murmur in the ear, which cannot be differentiated from the note of the tuning fork. When the ear noises are made to disappear by pressure on the appropriate spot of the mastoid mentioned above, the tuning fork perception is of normal duration.

A cause for the presence of these objective sounds has been sought persistently, but without avail. The heart, lungs and chest are apparently perfectly normal. No signs of aneurism are to be detected anywhere. There is no marked anæmia and no venous hum in the vessels of the neck, or elsewhere. The tympanic membranes of both sides are of normal appearance, the nose and nasopharynx absolutely normal, and the openings of the Eustachian tubes present nothing unusual. The fundi of the eyes were examined, with especial reference to the presence of pulsation in the choroidal vessels or orbital aneurism, but the report showed them to be absolutely normal.

These cases of objective tinnitus are extremely rare and not many are reported in the literature. They are of two distinct types, easily distinguishable, and the result of two distinct causative agents. The first type is characterized by a peculiar crackling noise, not unlike the sound caused by snapping of two finger nails together. It caused by a clonic spasm of the muscles in and around the Eustachian tube. The muscle most commonly affected is the tensor veli palati. These ticks are heard usually within six inches of the patient's ear; they have, as a rule, a constant pitch, and occur in rapid succession anywhere from forty to one hundred and fifty to the minute. In such cases it is usually possible to notice a twitching of the muscles of the soft palate synchronous with the clicking in the ear, each click being caused by a separate contraction of the tensor veli palati. Some people have the power of voluntarily producing this click by a voluntary contraction of the above named muscle. This type of

objective tinnitus is rather more common than the other. Such cases are reported by Kaufman[2], Schwager[3], Gerould[4], Baker[5], and others.

In the second class the sound perceived both objectively and subjectively is always a hum or murmur, usually synchronous with the systolic heart sound. This hum is a not unusual concomitant of aneurism in the neighborhood of the ear. Such entotic blood noises, when the result of aneurism around the ear or anywhere in the head, are easily explainable, and quite a number of such cases have been reported. These cases differ from the one now under consideration in that aneurism was demonstrated and unquestioned and in some of them there was a preceding history of trauma as a probable cause of the aneurism. Zur Mühlen[6] reports two cases of aneurism of the arteria carotis cerebri which were accompanied by the usual aneurismal murmur, that could be heard all over the head and, naturally, in the ear as well. In one case the right common carotid was tied with marked benefit and diminution of the noises in the head and in the ear. Muck[7] reports a case of entotic murmur due to aneurism of the occipital artery. Herzog[8] reports a case of aneurism of the mastoid branch of the posterior auricular artery accompanied by objective ear sounds. In this case the aneurism was easily demonstrable and manifested itself by a localized swelling back of the ear and not far from the tip of the mastoid. It will be remembered in the case we have described that slight pressure at a point on the mastoid just corresponding to this caused a complete cessation of the sounds. Poorten[9] reports a case caused possibly by an aneurism, preceded by a definite trauma. He says objective noises in the ear except due to aneurism are extremely unusual, and he found only three cases in the literature up to that time (1878).

Another condition which, in rare instances, causes objective sounds to be heard in the ear, is a marked anemia where the *venous hum* or *"bruit du diable"* in the vessels of the neck is transmitted also to the ear and may be heard there. Two such cases are reported by E. C. Baker[10] which showed marked improvement with the proper administration of iron.

There are, however, in addition to the entotic sounds resulting from the causes just given some rare cases, and the patient described is one of them, in which no definite explanation can be given for the occurrence of the objective sounds. Orne Green[11] reports two cases, one in a man and one in a boy, with no demonstrable cause, but in which he had reason to suspect a disturbance of the vaso motor equilibrium. Cowen[12] has reported a somewhat similar case. Rayer[13] reports a patient in which the symptoms correspond almost exactly with the case we have described. In his case pressure in the carotids caused only partial relief, but slight pressure on a point of the mastoid caused instant and absolute cessation of all the sounds. He was unable to find any signs of aneurism or to give any explanation of the sounds.

Various theories have been advanced to explain these objective sounds where there was no aneurism or other probable cause. None of them, however, seem to fit all the cases. Moos[14] explains them by assuming an abnormally large *bulbus venae jugularis.* He thinks the blood pouring into the bulbus from the comparatively smaller sinus would sufficiently account for the murmur. He reports an autopsy of a case where such marked subjective noises were known to have existed as to cause insanity of the patient, and where post mortem the bulbus was actually seen to be tremendously enlarged. There were, however, no objective noises in that case.

Gruber[15] explains the case of Rayer[13] by assuming the existence of an aneurism of the basilar artery. There was, however, in Rayer's case no ground for such assumption. Von Troeltsch[16] accounts for the same case, likewise without supporting evidence, by supposing an abnormality in the distribution of the posterior arteries of the ear.

Green[11] believes that the sounds are caused by transmission from the internal carotid where that artery passes through its canal in the petrous portion of the temporal bone. He thinks that a reduced vascular tension, caused by disturbances of the vaso-motor system, would allow the wall of the carotid to relax and so come into close contact with the dense petrous bone, which would readily transmit the sound to the ear of the patient and thence to the ear of the observer. This does not explain, however, why pressure on the mastoid would cause cessation of the sound or why pressure on the left carotid affects noises in the right ear.

Where no aneruism can be demonstrated then and where no marked anemia exists the cause of persistent objective tinnitis still remains a mystery and a subject for speculation.

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SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Stated Meeting, January 27, 1904.

FRANCIS J. QUINLAN, M.D., Chairman.

PRESENTATION OF CASES.

DR. HURD presented a case of "Radical Operation Upon the Antrum of Highmore.

A tooth which had been causing discomfort to the patient was extracted. Soon after, pus began to form in the antrum; and afterwards part of the root of the tooth was found to remain. This was extracted and a hole was bored through into the antrum and a soft rubber tube inserted, for drainage, which was used two years. At no time was it quite free from pus. Dr. Hurd proposed the radical operation: He removed the anterior and external walls of the antrum, finding about one-fourth inch of polypoid mucous membrane, curetted the mucous membrane down to the bone and removed the bone to the nasal side, from the nasal mucous membrane and incising the membrane horizontally through the middle. He made two flaps, putting one on the orbital roof of the septum and the other on the floor of the antrum, suturing them to the periosteum at the buccal wound. He discontinued the packing gradually, and in two weeks left it all out. At the end of another week, the patient had no trouble whatever.

DR. TOEPLITZ. "This patient is one that I am going to mention in my paper—a case of syphiloma, a granulation tumor from the nose which filled out the left nostril. It flapped back when you touched it so that it disappeared from view. The case has a large perforation of the septum which was hidden by the deviation. When I tried to remove the tumor it bled profusely. I could not remove the entire mass after many attempts. The microscope did not give a great deal of satisfaction, because it was considered more of a sarcomatous nature than anything else. With anti-syphilitic treatment the tumor disappeared—there is no trace of it, only the perforation. If you had seen this case before, you would hardly have believed that such a result would have been possible."

DR. LEDERMAN presented a case of syphilitic growth "granuloma," within the nose. The patient was first seen on Saturday, when he complained of catarrh, but gave a history of specific trouble. He stated that his nose annoyed him on account of the discharge. On examining the man the doctor's attention was first directed to this

growth on the upper surface of the inferior turbinate, on the left side. It looked like a polyp. It bled slightly and he had considerable discharge from the right side of his nose—which looked like disease of the frontal sinus or ethmoiditis. On further examination, a perforation through the osseous septum was discovered. The patient brought with him to the meeting a piece of necrotic bone that had come away on that day. Dr. Lederman stated that the septal growth was a broken down gumma, with some ulceration of the posterior wall of the pharynx.

Dr. Quinlan presented a case of traumatic suppuration of the antrum of Highmore. The patient, a little girl, received an injury about four months ago. She was brought to the clinic, and the doctor found quite an opening in which pus and granulations appeared. There was enormous swelling, the eye was closed—indicating serious mischief. The child was put under ether and an incision made. The antrum was found filled with soft spiculæ of bone, pus and granulation tissue—which was removed. It was found that this had extended and invaded the entire wall of the sphenoidal sinus. At the present time the patient is wearing a little gauze, but the deformity is nothing; although at one time, it was feared there would be a marked deformity. There is a little bulging on one side, but a *very* little.

Dr. Berens brought five cases, to show the result of the operation of which he spoke in his paper later in the evening, and gave a short history of each one:

(1) A woman who had been operated upon on March 5, 1903. She had an ulcerated tooth—a second bicuspid. This was removed and found to be diseased, the disease in her case extending up through the antrum (which was filled with polypoid degeneration), into the ethmoid and into the sphenoid. From the sphenoid there was considerable granulation tissue curetted.

(2) A woman, about 35 years of age, was operated on three years ago for frontal sinusitis and antrum disease. The first healed properly and promptly, but the antrum did not get well. Last July the Jansen operation was done, at which time, the ethmoid cells were found to be badly diseased, as was also the sphenoid. There was a possibility of adenoma; there is a slight swelling now on the antral wall, on the inside.

(3) A man, with a history running back to 1887, when he was operated upon by several members of the section for a deflected septum and for antrum disease. A second operation was done on his antrum unsuccessfully. Dr. Berens operated radically on him on January 6, 1903. He is now cured.

(4) A woman about 45, with a history dating back 18 years, when she had all the teeth removed from one side of her upper jaw on account of the neuralgic condition. Pus had been discharging from her nose since childhood; it came out in the form of scabs. She was operated upon January 8, 1903. She is cured. History of pus from nose for 12 years.

(5) A boy with frontal sinus opened. He was a case of multiple sinusitis on the right side, and multiple sinusitis, including the frontal sinus on the left side. The frontal sinus was opened, and the *right*-sided radical operation was performed at the same sitting, the left side being done at a subsequent time. A slight amount of pus persists in region of left infundibulum.

DISCUSSION.

DR. MYLES said that he attributed the success obtained in Dr. Herd's case, to the thorough manner in which the operation had been done —the incision being carried from the posterior part of the antrum across to the canine tooth, the bone had been bared over a greater area than usual, the lateral walls of the antrum had been chiseled away. The inferior turbinate mucosa was turned into the antrum, and the mucosa on the median wall of the antrum was also utilized.

DR. CHAMBERS, in speaking of Dr. Lederman's case of specific new growth, said that it reminded him of a case he had exhibited to the Section two or three years before—supposed to be a sarcoma of the septum. It was suggested to him that he put the patient on anti-syphilitic treatment, which he did, and inside of three months the sarcoma had entirely disappeared.

DR. QUINLAN, in referring to his own case which had been exhibited, said, there was pressure on the lateral wall of the nose, pressure on the floor of the orbit; that the pus was not of a fluid character, but of the consistency of jelly; tenacious, granulation tissue, of a melting consistency, was present. There was a very extensive opening at the canine towards the median line.

DR. BERENS spoke of a similar case which he had had five or six years ago, resulting from injury from a split stone, which had perforated the cheek. It healed up very much the same as the case shown by Dr. Quinlan. The interesting point was, that there was no disease of the antrum itself, other than the slight amount of granulation tissue, and on removal of this, it healed.

DR. GLEITSMAN cited the case of a boy of 14 years, to whom he had been called about a week ago. The boy had been taken to the German Hospital on Friday and claimed that he had swallowed a pin. On examination there was no reflex action in the throat; the boy exhibited no symptoms, there was no cough and no irritation, no soreness; no anomaly seen on laryngoscopic examination. The doctor concluded that it was safe to leave the pin in for a day or two, to see if it would not change its position. On Monday afternoon the boy said he felt a little tickling. On examination, the doctor could see a little muco-pus covering tre head of the pin. The point was pointing upwards—it could be seen distinctly. He took a strong, slender tracheal forceps, intending to catch the point, but as soon as the instrument was introduced into the larynx the boy closed the cords tightly. The doctor waited a few seconds, the boy began to gag, and the pin was gone. He decided the safest measure would be to ask for surgical aid and for tracheotomy. He waited a day for

the pin to appear in the same region. On Tuesday the pin had not appeared, and the condition was the same as on Saturday and Sunday—still no symptoms whatever. The boy was subjected to careful and prolonged tests with the X-ray, inspected repeatedly; a photograph was taken on Saturday. When the pin could not be seen, the doctor naturally doubted its existence; two physicians in the hospital where the boy was taken, however, stated that they had seen the pin on Saturday. On Monday the process was repeated, and on Tuesday, before performing the tracheotomy, the surgeon said, "Are you sure there is a pin in the throat? I said that I had seen the point the day before, but not the pin itself; that I had depended on the assertion of the assistants. With the expert in charge of the photographing, the surgeon and myself looked at the boy, but could see nothing. The surgeon thought that he saw the pin in an oblique position, but this proved to be wrong. The repeated photographs did not prove anything. The removal was very simple—with a little disappointment. When the low tracheotomy was done we could not make the incision as low down as we wished to. We inspected the trachea with electric light, but could not illuminate very far down. The boy coughed, and the point of the pin presented itself in the wound. If the assistant had had the forceps in his hand he could have grasped the pin. A few minutes afterwards the boy coughed again, and this time the pin was extracted. I think even with a full inspiration the vocal cords would not have opened far enough to allow of bringing the pin which had a broad plate, through the natural channel. The most interesting point to me in the case was—that the Roentgen Rays did not show any picture of this foreign body.

DR. CHAPPELL told of a case he had seen several years ago, where a darning needle had gotten into the trachea of a boy. He tried several times to get hold of the needle, but failed. He then gave the patient a large tumblerful of salt water and immediately turned him upside down, when the needle was emitted by vomiting.

DR. MYLES cited the case of a woman who ten years ago came to his office with a large tack in her larynx, the head of the tack was lying on the processus vocalis on the right side and the point on left vocal cord near its attachment to the thyroid cartilage. Every time she breathed, it appeared as if the head would drop into the trachea. Turning the patient upside down had no effect. The woman would not consent to tracheotomy. She was rather hysterical. The tack was seized with a very powerful pair of laryngeal forceps; a small part of the ventricle was torn, and after considerable struggling the foreign body was extracted.

DR. WRIGHT told of an experience he had had a few weeks since, when he was called to go over to some remote part of Williamsburg to see a case. The message was given over the telephone and he could not ascertain what the matter was. He was unable to go that day, but when he did go he found an Italian physician in attendance who could not speak a word of English. After considerable difficulty he learned that the patient was an Italian boy, who had a bean

in his larynx, and, as far as he was able to understand, it was below the vocal cords. The boy was gasping for breath. There was poor illumination, but Dr. Wright looked into the larynx and saw there a large Italian bean. It looked like a whole one, but that could not have been, for they are too large. It was well below the edges of the vocal cords. What to do, was the question. The Italians wanted the bean out then and there. After much persuasion it was agreed to remove the boy to the hospital, where a low tracheotomy was done, pushing the bean up into the pharynx. He desired to emphasize the unwisdom of attempting to grasp objects in this situation by endolaryngeal procedure. Such an attempt is usually followed by the disappearance of the foreign body into the depths of the bronchi below and the very simple procedure of a low tracheotomy is unnecessarily succeeded by exceedingly difficult and desperate attempts to fish it out. The patient's life is then in serious jeopardy.

Dr. Simpson spoke of the importance of knowing the size of the foreign body, and said that with the use of the cylindrical intubation tubes, the short, large size, the foreign body, if small enough, may be expelled through the tube, by coughing or inverting the child.

Dr. Douglass said that it was interesting to note that foreign bodies are often tolerated very well in the trachea, but sometimes they produce instantaneous death. He cited a case, that of a young lad who, while playing on the street, suddenly dropped dead without any effort. There was no spasm of any kind, not even choking. An autopsy was made, and on examining the larynx, it was easy to distinguish the half of an ordinary peanut, which the boy had evidently had in his mouth and inspired into the larynx. This was lodged against the vocal cords in each vestibule of the larynx, and there was plenty of space for respiration in front and behind; there was no oedema, and it was quite easy to blow air through the trachea and the larynx and prove the boy had respiratory space. He died from acute cerebral anæmia, due to reflex disturbance in the larynx.

Dr. Quinlan referred to three cases of foreign bodies which he had seen—peanut shells, not only in the larynx, but in the bronchial tubes, all proving fatal; all died either of pneumonia or abscess, but not of suffocation. There was no shock to the nervous system or anæmia.

Dr. Quinlan also referred to a case seen at St. Vincent's Hospital, a boy, who was brought there in extreme pain, black, and with all the symptoms of dissolution from suffocation. He had been running up and down with a screw in his mouth and had sucked it in. He was examined and the doctor could see the screw, but when he grasped it, it would not bulge. After making several attempts, he concluded to do a tracheotomy. He made a low tracheotomy incision, when another head came into view. It was a double-headed screw about one inch long. The larynx was immediately sewn up in this case.

EXHIBITION OF NEW INSTRUMENTS.

DR. MAYER exhibited a device for cleansing the accessory sinuses which he considered a very valuable acquisition, inasmuch as it does away with the old time method of having a bottle or fountain syringe, hung above the patient with its uncertain dropping.

It was made for him by Tiemann & Co. from designs furnished by Dr. S. Yankauer of this city. It consists of a strong wash bottle, capable of holding three pints and so constructed as to be able to contain water at high temperatures, with simple stop cocks at inlet and outlet, and a gauge to register up to 20 pounds. It is claimed for the new device that a steady stream can be had at any pressure up to 20 pounds, it stands on a table along side of the patient, is filled within thirty seconds by attaching the compressed air apparatus found in every office.

A powerful stream of a very steady nature flows, and in the hands of the speaker, this apparatus has proven very satisfactory.

DR. TOEPLITZ read a paper entitled "Nasal Tumor of Specific Origin," and abstract of which is given below:

Among the tertiary lesions of syphilis are nasal tumors or other large gummata or granulomata (syphilomata). A case of the latter type was observed by Dr. Toeplitz in a woman, æt. 26, who suffered from obstruction of left nostril, formation of thick crusts, loss of sense of smell and severe epistaxis. The obstruction was due to a large grayish-red tumor, springing from the upper portion of the bony septum, viz.: from the upper raised boundary of perforation, through which the tumor disappeared into the right nostril.

Histologically, the tumor consisted of loose connective tissue covered by stratified epithelium, which dipped down and formed retention cysts. There were large blood vessels and areas of round cell infiltration, as also of larger round cells with large nuclei, which we suspected was sarcomatous. The tumor was removed piece-meal under severe hemorrhages, but did not disappear entirely until mercury and iodide of potassium was vigorously and extensively administered in two courses of inunction, and the latter up to 50 grains per dose.

There are but three analogous cases found published, which are fully given. Another kind of granulomata are multiple, resembling papillomata. From gummata they are distinguished by the lack of tendency to decay. The syphilomata are free tumors, pure connective tissue growth.

The best criterion for the diagnosis is the success of the antisyphilitic treatment.

DR. BERENS read a paper "The Radical Operation for the Cure of Chronic Suppuration of the Antrum of Highmore, Sphenoid Sinus and Ethmoid Cells.

This paper is published in full in this issue of THE LARYNGOSCOPE, *page* 177.

DR. COAKLEY said it was hard to tell just what the extent of the diseased condition in the sinuses was before the patient is operated upon. In the chronic cases, some suffer considerably with neu-

ralgia, when the drainage is poor, while others simply complain of more or less nasal discharge. It seemed to him that there was too great an anxiety to operate before studying or diagnosing the case sufficiently. In chronic cases he never advocated operation until the case had been thoroughly studied, so as to determine just how many of the sinuses are involved.

He claimed that it was easier to pass a probe into the normal opening of the sphenoidal sinus, than it was to enter the normal opening of any of the other accessory sinuses. He said that the Jansen operation did not appeal to him very much. He believed in doing what he could for the disease of the ethmoidal cell region, in a majority of cases by the nasal route. He believes that the operation on the ethmoidal cell by way of the antrum will leave as many cells unoperated on and still discharging, as is sometimes the case in operating through the nose. In any type of operation the anatomical structure of these ethmoidal cells is such, that it is well nigh impossible to clean them all. As for the operation on the sphenoid, he also prefers the nasal route; cutting away the middle turbinate, if necessary.

The antrum operation which he has been doing, is practically taking away all the anterior wall, allowing the lateral tissue to fall in, and granulations to spring up over the denuded bone, so filling and obliterating the cavity.

DR. LEDERMAN stated that he had seen two cases of what could be called acute tumors of specific origin. He said that the case he had presented at the meeting was one of rare occurrence. The growth originated from the upper portion of the inferior turbinate. He had recently seen a case which was diagnosed malignant growth, where destruction of the septum had taken place. Large doses of iodide and inunctions of mercury were successful in effecting a cure. He considered it a question, however, whether in this class of cases anything was gained by snipping off the growth, and intended to give large doses of iodide in the case exhibited, to see if it could be absorbed.

DR. CHAPPELL called attention to the fact that some years ago he saw a case where there were numerous small growths in the secondary stage of syphilis on the septum, and also some very large growths on the inferior and middle turbinated bodies, which all disappeared under anti-syphilitic treatment.

DR. GLEITSMANN reported upon the case of a patient who came to him, a married man, of French extraction, with an extreme obstruction of the nose. He could not breathe, had excessive pain and discharge. The man had been sent by a dermatologist who happened to be a friend of both the doctor and the patient. Before this time, the patient had been in the hands of some throat specialist for treatment, the specialist advising an operation. The dermatologist told him that his nose was in such an irritated condition that the operation which had been urged by the former doctor was, in his opinion, a mistake. The patient then presented himself before Dr. Gleitsman, who, on examining him, saw a very much hypertrophied turbinate on both sides, and in addition, a projection of the septum,

which the physician had wanted to remove. The case appeared to be an acute condition of the nasal passages—certainly not in a condition to operate. Soothing remedies were given to the patient, and at the end of the second week he complained of pain in the throat. A slight erosion was discovered on the posterior wall of the pharynx, and a marked erosion on the posterior pillar of the left side, back of the tonsil. Dr. Gleitsman then reported to the dermatologist that the case looked like syphilis, which fact was confirmed. He then placed the patient upon a treatment with mercurial ointments, without operation, which entirely relieved the constitutional and local disease.

DR. TOEPLITZ said that what he wished to bring out in his paper was, that the granulomata are a special class of tumors, due to specific origin. They are not directly syphilitic, but they are distinct tumors which spring up on the gummatous parts and are due to irritation. The multiple tumor is of another class and is much more frequent.

DR. WRIGHT, in discussing Dr. Berens' paper, remarked, that a number of years ago he had read with a great deal of interest the communication of Jansen in which was advocated this method of operating. But, while he had seen a little of it in the practice of others, he could never bring himself into entire accord with the principle of it. He drew attention to the fact that these cases of sinus disease vary tremendously, some of them being very favorable for the operation spoken of by Dr. Berens; for instance, a thin, old woman or a man in which the cheek muscles are not much developed. In such cases, he said, the incision exposing the anterior and lateral face, especially if the antrum is not too wide and deep, will frequently give a free access to the upper regions of the nose. In regard to the indications for these opreations, he thought we were a little carried off our feet in our ardor to attack these sinuses, especially the ethmoid; that while operations could be done upon the frontal sinus and antrum of Highmore and the sphenoidal sinus without any great danger to the patient, he considered a radical operation upon the ethmoid a very grave affair indeed. He said that while cerebral abscess in sinus disease was very rare, the cases in which it has occurred have very frequently been those in which the ethmoid sinuses have been operated upon. On account of this, Dr. Wright said that it had been his custom to leave these cases severely alone, unless there was some very decided reason why they should be operated upon, as, perhaps, the case shown by Dr. Berens. He stated that the theoretical objections he had were, that the ethmoid sinus was approached from the wrong direction, that it is approached from below and in front, and the instruments are necessarily pointed towards the brain; that one can never be sure while getting too close to the floor of the cerebral cavity that you have curetted all of the ethmoid cells; that the instrument must be directed from below upward, and that it is very easy to make an excursion one-sixteenth inch too far in the upper direction and produce fatal mischief in the region of the cribriform plate. Continuing, Dr.

Wright stated that he considered the old operation the most rational one—going inside of the frontal sinus and opening the sinuses up through the orbit and destroying them in this way—because the direction of operative procedure is parallel to the base of the brain and one in which you can venture to use more force, this being a direction from before backwards, rather than from below upwards. He said that he had been somewhat interested in a very much more radical and to his mind inexcusable method of procedure inaugurated by Partsch and recently quite extensively employed by Loewe, not only in malignant diseases of the roof of the cavity and post-nasal space, but in simple cases of polypi and sinus disease. He goes to work and frees the whole floor of the nose from its attachment to the five vertical plates, viz., the inner and outer walls of the antrum on each side and the septum nasi between them. The whole floor of the nose is then forced down on the tongue and the operator then proceeds to the evisceration of the cavities above. He said that we must certainly condemn such procedures, that while the Jansen operation and the one so clearly described by Dr. Berens are not for a moment to be compared to this, it was his belief that even the one he (Dr. Wright) had referred to should be done with the greatest care, and the greatest reluctance, and only in cases in which it is fully warranted. It was his opinion that where you can get along by clearing out the nasal cavity, by opening the antrum of Highmore and the sphenoidal sinus, by taking out the middle turbinate bone, and especially opening from the nose the ethmoid cells, in the majority of cases it was preferable to doing this other operation, for he felt sure that a large proportion of the cases were not so simply done as those Dr. Berens had shown at the meeting. He spoke of opening the sphenoidal sinus. It is a comparatively safe and simple procedure, where one thinks the disease is limited to that sinus alone. It occasionally happens that one has an isolated sinus disease; Hyrtl declared 40 or 50 years ago that disease of the sphenoidal sinus was inoperable. This has been amply proven to be an entirely erroneous opinion. He spoke of a method of using the Troutman curette with a proper post-nasal curve and with the finger in the post nasal space, puncturing and breaking away the anterior wall of the sphenoidal sinus, which, he said, had been done with considerable ease. He had operated once or twice by introducing the finger into the post nasal space and the cutting instrument through the nose, and thought that in cases where this could be substituted for the more extensive, less reliable and more difficult operation of Jansen it was eminently desirable.

Dr. Myles said that it was impossible to do justice to such an important subject in a limited discussion, that Doctor Berens had certainly somewhat Americanized the European idea of the progressive surgery of Luc and Jansen; we were all working for one object, the cure of these cases, but he feared at this juncture, that the selection of the proper treatment for each case, was a difficult proposition.

He thought the operation for radical cure of the antrum was practically easy now, and that the patient was usually the most earnest

one to solicit it. He did not know that he had grasped the exact technique of Dr. Berens' operation, when penetrating the ethmoidal region and then reaching the sphenoidal cell, and the instruments he used for enlarging the opening into the sphenoid, but he recalled that Luc utilized his instruments by tearing away the bones and soft tissues, tamponing at intervals for hemorrhage. He said that with the use of the tearing instrument that there would not be nearly so much hemorrhage. He spoke of the cases he had seen from time to time of Woakes, who had different instruments made to plow into the front of the ethmoid and gouge it out from the front, backwards, and said that he had seen several diseased conditions of extensive adhesions to the septum, that there was more or less pus issuing through fistulæ at points on the adhesive areas. Placing the membrane over the denuded parts, and saving the mucous membrane is in the right direction in the open radical method for antral cases. He usually cuts and snares the ethmoid away through the nose, and penetrates the sphenoidal cell through its anterior wall.

In certain cases it seemed best to obliterate the antrum by granulation tissue. Many antrums, that have resisted the usual methods of treatment, do well with large permanent openings in the nasal walls.

Dr. Douglass said that the subject had appealed to him; that he would first like to discuss Dr. Berens' operation and then make some remarks in answer to Dr. Wright. With reference to the results attained by Dr. Berens, he thought they were splendid, that he was to be complimented upon them. He considered the Jansen operation was in some ways to be criticized—if the technique was to be carried out as suggested by Dr. Berens, and the first point of criticism was, that he turns the anterior end of the inferior turbinate into the anterior angle of the antrum. He considered that if he should do that in order to make a counter opening into the inferior meatus there would be almost certain danger of getting up a lachrymal dachryocystitis, the duct being so near the angle of the turning that if the inferior turbinate is turned into the anterior angle it must include the lachrymal duct; that he would be interested to hear whether these cases developed any lachrymal stenosis. In speaking of the Jansen operation, Dr. Douglass said it should never be used unless the antrum is the seat of empyema; that if the antrum is the seat of empyema and the sphenoid also, there is perhaps no better way of reaching the sphenoid than through the antrum; and that there is very little danger of perforating the brain; that the posterior ethmoid cell is the widest of all the ethmoid cells, being nearly one-half inch wide in the average adult, generally from one-half to three-quarters of an inch in height; that when one leaves the antrum by the antrum roof and perforates the posterior ethmoid cell he has at least three-quarters of an inch in which the instrument may slip before it will reach the roof of the sphenoid. The doctor stated that there was almost no danger of perforating the roof of the sphenoidal sinus by way of the antrum roof; that if the sphenoid and ethmoid are alone diseased, without the antrum being involved, then the sphenoid is better reached by another route; there is very

little danger of doing any harm to the adjoining regions of the antrum in reaching from the antrum if one keeps near the median line; and by keeping to the median line you will enter the nose or posterior ethmoidal cell, and in either case there is no danger of perforation of the brain. He believes that if the sphenoid or ethmoid is diseased but not the antrum, then the best route to the sphenoid is through the posterior ethmoid cell in the nares again, that to leave the ethmoid sinuses and operate on the antrum would be to furnish further complication of the antrum trouble; that the merest student did not perforate a brain plate doing the ethmoid operation on a cadaver; he had seen but one or two men perforate a brain plate, and they had never before done such an operation upon a cadaver. Dr. Douglass said he had never seen the Jansen operation done by Jansen, and he rather dreaded some of the terrible results which he heard of and read about, but that he believed the best way of reaching the sphenoid was by the Jansen route, in case the antrum was diseased. He remembered hearing Dr. Cryer of Philadelphia recommend reaching the sphenoid directly through the antrum, but said that Dr. Cryer had not mentioned going through the posterior ethmoid cell. Dr. Cryer stated we should go from the antrum directly into the sphenoid, but that this was not feasible, as it was only when the sphenoid was abnormal in size that such a thing can be accomplished.

Dr. Curtis said that he remembered the paper of Dr. Cryer last winter and his remarkable statement that he did not believe the antrum could be syringed through the natural orifice. He thought Dr. Wright was mistaken in regard to some of his conclusions regarding the entering of the sphenoidal sinus from the orbit, but he considered him right in saying that the ethmoid cells were not all implicated in a vast majority of cases of frontal sinus infection. He thought that depended on whether the fronto-nasal duct emptied into the infundibulum or the gutter of the bulla, in which case it was more apt to infect the middle cells. He spoke of having trephined a sphenoidal sinus in 1889, which he had reported to the section and shown the tube and manner of syringing he had employed. This had seemed to him a simple thing. By removing the middle turbinate he succeeded in trephining in the region of the natural orifice and washing out the sinus.

In regard to the necessity of operation, the doctor spoke of the fact that in many cases there was little or no pain. He instanced a case which had been going on for seven years with profuse discharge but with no pain whatever.

He did not agree with Jansen entirely as to the best route to the sphenoidal sinus; he could see no advantage to be derived from the destruction of the entire wall of the antrum, and held that if the mucosa of the nose was left *in situ* a great deal of necessary moisture was thus saved; he thought the destruction, or transplanting of the membrane a great mistake, and did not see why the flaps should be turned in, since a good deal could be preserved to filter the air and moisten the nose. Dr. Curtis stated that he had no more fear of entering the brain cavity in this than in doing a mastoid operation,

and he did not think breaking the cribriform plate was necessarily going to do fatal injury; he had seen cases where the plate had been pretty well demolished and yet the cases had survived. He claimed that we had much more to fear from infection through the ophthalmic vein in the orbital route in entering the sphenoidal sinus than from injury to the dura or brain, and that there was much more danger in mastoid cases from infection through the lateral sinus than by injuring the meninges. Generally speaking more serious consequences were to be anticipated from infection, than from injury to the cerebral structures.

DR. BERENS, in answering Dr. Wright's remarks as to the probable success of his operation on only thin, old people, stated that the case referred to in his paper was that of a woman weighing 220 to 230 pounds.

He stated that the operation which he had rescribed was the one done by Jansen a year ago, not the operation which had formerly been described by Jansen, who has discarded the skin grafting and come back to the mucous membrane operation; that the inferior turbinate mucous membrane was one of the most important parts of the whole nasal mucous membrane, and that he saved from the periosteum to the mucous membrane; he had seen cases with coryza after the operation, and had found the inferior turbinate in a state of erection at the anterior and posterior ends. He thought it was really essential to save the mucous membrane. He stated that he had not closed the oral wound in any of the patients shown that he had operated upon, for the reason that he was afraid the healing would not take place in the way he desired to have it, and wanted to keep the wound open to watch the process of healing and its progress.

As to the technique, he said: "After the removal of the ethmoid cells and the middle turbinate with the sharp curette, the sphenoid comes into view. I have succeeded in all cases in breaking down the wall of the sphenoid with a heavy, sharp curette. Where the sphenoid wall is somewhat heavy (as a rule, in my case it was thin and necrotic) I used first a small curette, and enlarged until I got rid of nearly all the anterior wall of the sphenoid. The post-nasal operation is not a good surgical procedure. I do not want it thought that I am operating on every case of antrum disease by this very radical, somewhat dangerous and always difficult operation. It is not an easy operation, even when you know your anatomy, and even when you have performed it on skull after skull; you always do it with considerable trepidation. I warn you against unskilled surgery and against undertaking this operation until you have done it many times over on the skull.. After you have done that, you can go in and eradicate the ethmoid region down to the orbital table of the lateral wall. I do not believe that in some of my cases I removed all of the ethmoid cells, but those cells were comparatively unimportant. The patients were enthusiastic at the results obtained, since they had been operated on by others without relief."

BRITISH MEDICAL ASSOCIATION.

Seventy-first Annual Meeting, held at Swansea, July 28-31, 1903.

SECTION ON LARYNGOLOGY AND OTOLOGY.

PATRICK WATSON WILLIAMS, M.D., President.

(Continued from page 149.)

Discussion on the Local Use of Formalin in the Treatment of Nasal Polypi Before and After Operation on the Same by the Usual Methods.

DR. BRONNER said: I do not intend to enter into any discussion on the causes and treatment of nasal polypi, but wish simply to record my experience with the local application of formalin in these cases.

Thanks to the good work recently done by Zuckerkandl, Hajek, Grünbaum, Lack, and others, we know that nasal polypi are the result of chronic inflammation of the mucous membrane, due to local irritation by pus, etc., or to focal suppuration, and that generally the underlying periosteum, often also the bone, is diseased. In many cases one or more of the accessory cavities, especially the ethmoidal cells, are affected. This partly explains the great tendency of the polypi to recur, and the frequent necessity for surgical interference.

All specialists, but I am sorry to say not all surgeons, have long since discarded the barbarous method of removing polypi by introducing forceps, and pulling out as much of the interior of the nares as they can catch hold of. (They have a special preference for the unoffending lower turbinates.) The cold or hot snare is now invariably used. I remove as much of the polypi or diseased mucous membrane as I can with the cold snare, and then apply formalin on a probe with cotton-wool to the roots of the polypi. I try not to cut through the pedunculated polypi, but to pull them out by the roots, and thus I often succeed in removing the whole of the polypus, and in many cases also part of the underlying diseased bone. Before using the formalin I again apply a powder consisting of equal parts of cocaine, eucaine, and desiccated suprarenal extract to the parts with a probe and cotton-wool.

After a few days a formalin spray (1 in 500, up to 1 in 100) is ordered to be used ter die for a week or two, and then less frequently. The patients are all asked to return again in one month. If the spray is painful (and some patients are extremely sensitive to formalin) I order a paroleine spray to be used before the application. The formalin not only acts as a powerful disinfectant, but also causes con-

traction and hardening of the diseased tissues. I also order insufflations of tannoform, aristol, and boric acid. As long as there is much discharge an alkaline spray should be used. Often the middle turbinate is extensively diseased. In these cases I remove the anterior part of the bone by forceps or snare. Messrs. Mayer and Meltzer have recently modified Grunwald's forceps and made them larger and stronger.

Before operation the nares should be most carefully examined, the swelling of the mucous membrane removed by the local application of equal parts of powdered cocaine, eucaine, and desiccated suprarenal extract, and all the cavities and recesses, as far as possible, examined with a probe. Thus, and only thus, can an accurate diagnosis be made and scientific treatment adopted.

I use this method in all cases of polypi. In many surgical interference becomes necessary, but I do not think we should have recourse to this before we have thoroughly tried local medical treatment for some weeks or months and removed the polypi numerous times, and used formalin during the intervals.

It is often impossible to tell how many of the accessory cavities are affected. In most cases the frontal and ethmoidal cells are diseased. Lack strongly advises thoroughly scraping these cells under a general anæsthetic, and has published numerous successful cases. I have followed his suggestion, but my cases have not all done well. Nor, I may say, have all other surgeons had good results. I have seen numerous cases reported as cured in which recurrence has taken place. The operation is also not devoid of danger, and many fatal cases have occurred, although they have not been recorded. If local medical treatment fails I remove under a local anæsthetic part of the middle and upper turbinates with forceps, sharp spoon, or snare at several sittings. If eucaine and suprarenal extract are used there is not much pain or hemorrhage. In the interval between the operations formalin and tannoform are applied locally.

Nearly all the numerous cases in which I have operated during the last three to four years have, so far as can be judged in so short a time, been very successful. I see the patients every month, and if there is the slightest recurrence of polypi I remove these with the snare and apply formalin. In some cases numerous operations are necessary, and the polypi seem to recur in a less degree each time. In Yorkshire nasal polypi (as all diseases of the nose) are extremely common, much more so than in the South, so that we have ample opportunity of seeing and treating a large number of cases.

Dr. Herbert Tilley thought Dr. Bronner was making too sweeping a statement in saying that the majority of nasal polypi were caused by accessory sinus disease. For practical purposes he always divided polypi into those which were and those which were not associated with suppuration. In the latter class of cases accessory sinus suppuration was always present, and was probably the cause of the polypi.

DR. CHILDE advocated the removal of polypi with forceps according to the method of Sir Mitchell Banks. He thought it was not possible to be too thorough.

The PRESIDENT thought that formalin probably acted much in the same way as the galvano-cautery. The latter produced a sort of local boiling of the parts, and was an excellent antiseptic.

DR. JOBSON HORNE inquired whether the possible danger of injuring the olfactory structure by the use of formalin in the treatment of nasal polypi was outweighed by the good results obtainable, also whether it was advisable to entrust to patients the application of formalin in efficient strengths by means of sprays.

DR. BRONNER, in reply, explained that he applied formalin on a brush of absorbent cotton, strictly limiting its action to the diseased parts, and protecting the neighboring tissues with paroleine or some similar preparation; it was applied, in fact, exactly in the same way as pure carbolic acid or any other strong caustic.

Illustrations of the Effects Produced by the Singing Voice in a Suitable Medium.

ARTHUR HAYDON, M.D. In opening I may say that I am bringing before the notice of the British Medical Association an entirely new subject, but one which will be of great interest both from a physiological and pathological point of view. It may also prove to be of some value as a means of diagnosis.

It has recently been discovered that the vibration of the singing voice in perfect health, when tested by a certain apparatus known as the idiophone, will produce the formation of pictures of flowers in various colors.

I will here give a description of the idiophone, which is employed to secure these results. A porcelain cylinder is used, measuring 6 inches in length, with a diameter of 5 inches, closed at one end by the same material, and open at the other. In the wall of the cylinder two holes are made on opposite sides, and into each hole a long tube is inserted, provided with a mouthpiece like a speaking tube. Over the open end of the cylinder a membrane of great delicacy is placed, and this is covered by lycopodium dust; the under-surface of the membrane having been previously coated with a layer of gelatine, and on this various paints of the primary and secondary colors in the form of fine powder dusted.

In order to produce the results mentioned above the vocalist will now sing into one of these tubes, the other being left open; the voice is therefore bottled up for a time in the cylinder, and the vibrations during its transit have been found to cause the various colors to pass through the gelatine and coalesce to form the most extraordinary and beautiful pictures of flowers; and these can be seen on the exposed surface of the membrane. The pictures vary in character according to the timbre of the voice, the time of the music, whether it be Adagio, Andante, Allegretto or Presto. Also if the music is

phrased as in Legato passages or separated as in Staccato movements. The results of the experiments with the idiophone have been photographed.

Turning now to the application of this invention to medicine, I would add that the diagnostic value of the idiophone will depend upon the pictures formed on the membrane as the result of the change in the voice produced by abnormalities of the lungs, bronchi, trachea, larynx, pharynx and palate. All these abnormalities are associated with well known diseases, and will produce by means of the idiophone definite pictures; and valuable records can be obtained to be added to the clinical report of the case.

We shall therefore find, I have no doubt, that before long this new means of diagnosis will be added to every throat hospital and throat departments of general hospitals, and also form part of every physician's and surgeon's equipment. In conclusion, I may also draw your attention to the curious geometrical figures produced by vibrating fine chald powder on a steel or glass plate, by placing a finger on one edge of the plate to produce a node, and drawing a violin bow against the opposite edge of the plate. As the position of the finger is changed, so different geometrical figures are the result. These are known as the Chladni figures, and certainly demonstrate the fact that all musical sounds which have even vibrations will produce definite pictures on a suitable medium. Membranes also vibrate in a similar way. The forms of their nodal lines are generally even more complicated than those of the plates. The general rule is that to a determinate note belongs a determinate figure for the same membrane or plate, and that the figure is more complicated as the note produced is higher.

Discussion on the Upper Respitory Tract as a Source of Systemic Infection.

DR. DE HAVILLAND HALL said: The subject of the discussion is one of great interest to me, and one which has engaged my attention for some years past. In my opening remarks in the Lettsomian Lectures, which I have delivered before the Medical Society of London in 1897, the following passage occurs: "Before entering upon a description of the nose and throat affections of the acute specific diseases I would like to accentuate the extreme importance of the nose and throat as the chief portals of entrance of the poisons, whatever they may be, which give rise to these diseases." In the six years which have elapsed since these lectures were delivered more and more evidence has been accumulating in support of the opinion which I then expressed.

In no branch of medicine has greater advance been made than in the knowledge of the methods by which diseases are propagated. The whole subject of infection has required to be rewritten since the recognition of the part played by micro-organisms in disease. It is only since the discovery that many, if not most, constitutional affections depends on the presence of bacteria, that attention has been directed to the upper respiratory tract as a source of infection. Indeed,

until particulate organisms had been proved to be the cause of various diseases, there was nothing more than a vague idea that certain smells, for instance, might cause sore throat or headache. Now we are in a position to demonstrate the route taken by these organisms, and I look to Dr. Jobson Horne to prove this to your satisfaction.

As it will be impossible in the time at my disposal to consider all the diseases which enter the system through the portals of the upper respiratory tract, I must confine myself to some of the more important. With you, Sir, in the chair, I feel that I must commence with typhoid fever, as in the extremely valuable paper on five cases of this disease which you read before the meeting of the British Medical Association in 1894, you adduced evidence to support the view that the respiratory tract was the source of primary infection in one of the cases.

I have myself had one hospital case in which the disease appeared to have started in the larynx. Though typhoid fever is almost invariably propagated by means of the stools and urine, there is sufficient evidence to show that the Eberth-Gaffky bacillus may find its way into the system through the respiratory tract. This is the more likely to be the case if the vitality of the laryngeal mucous membrane is lowered owing to previous inflammatory mischief.

Dr. Watson Williams's patient was particularly vulnerable, as he had suffered from old-standing laryngitis. These cases confirm Budd's view that, under certain conditions, typhoid fever was infectious, and they should lead to the expectoration being disinfected.

Though the particular organism responsible for measles has yet to be identified, the mode of onset points conclusively to the poison being received via the respiratory tract; at present, however, there is no definite evidence on the subject.

Even more certainly than is the case in measles is the evidence conclusive that Pfeiffer's bacillus, the micro-organism of that polymorphic disease, influenza, enters the system through the respiratory tract. I have seen many cases in which the trouble appeared to start in the naso-pharyngeal space and I am strongly of the opinion that adenoid vegetations or enlargement of the pharyngeal tonsil render the individual more liable to contract influenza and many other infectious diseases. The same may be said with even greater emphasis of the faucial tonsils, and I think that parents and others having the charge of children cannot be too strongly impressed with the danger of allowing them to go about with adenoids and enlarged tonsils. Not only is the risk of infection much increased, but should a disease like scarlet fever or diphtheria be contracted they are in greater peril of their life. The preliminary catarrhal stage of whooping-cough would clearly seem to indicate that the poison, whatever it may be, enters through the respiratory tract. In diphtheria there can be no doubt that, in the great majority of cases, the Klebs-Loeffler bacillus implants itself in the tonsil, and probably enters its substance though some abrasion of the epithelium. At the onset the disease is a purely local one, the secondary symptoms being due to the absorption of toxic materials secreted by the bacilli during their growth. How

purely local the disease may be at its onset is shown by two cases under the care of Mr. Charters Symonds in which there was unilateral nasal diphtheria.

I remember seeing some years ago a case in which I was uncertain as to the diagnosis until I made a rhinoscopic examination, and on so doing I found a characteristic deposit in the naso-pharynx.

This localization is more frequent than is generally recognized, and it is probable that some of the cases usually regarded as primary nasal diphtheria really commence in the naso-pharynx, and that the nose is affected by extension. In the primary laryngeal form clinical evidence is in favor of the view that Klebs-Loeffler bacilli enter the system through the laryngeal mucous membrane, but as to what determines the point of ingress we are ignorant. Possibly there is some vulnerable spot in the larynx. The usual course, however, is for the larynx to be affected by extenuation from the pharynx. I am convinced that the nose plays an important role in the diffusion of diphtheria. During an epidemic of diphtheria children suffering from nasal discharge mixed with blood, and especially if they have enlarged cervical glands, should be isolated and the secretion examined bacteriologically. There can be little doubt that many a case of diphtheria in which the source of infection cannot be traced owes its origin to a case of nasal diphtheria which has been overlooked, or to the persistence of the Klebs-Loeffler bacillus in the nasal secretion of a patient who has had diphtheria, but who has been considered convalescent and free from infection.

The old idea of fixing a definite period of quarantine after a patient has suffered from diphtheria is now quite untenable. No individual convalescent from diphtheria should be allowed to mix with his fellows until both the nasal and buccal secretion has been found to be free from the Klebs-Loeffller bacillus.

It would also be well that apparently healthy persons who have been in contact with diphtherial patients should have their secretions tested, as it has been shown that in nearly 20 per cent of such persons the specific bacilli are present in the mouth.

I have had rather a curious experience in reference to the reception of the virus of scarlet fever by the nasal mucous membrane. On two occasions within three days after I applied the galvano-cautery to the nasal mucosa, scarlet fever has attacked the individual. In one case the patient was a medical man who as house-physician at a London hospital had been frequently exposed to infection before, but had escaped. I am of opinion that in these cases the germ entered the system through the wound caused by the galvano-cautery, though it is of course possible that these two cases were only coincidences.

The conclusion to be drawn from these cases is the advisability of abstaining from operative procedures on the nasal mucous membrane in persons liable to be exposed to septic and infectious diseases.

Lacunar tonsillitis is another disease which I have seen as the result of intranasal cauterization. Its onset is determined much in the same way as in the cases of scarlet fever referred to above.

Kronenberg records a case in which after an operation in the nose tonsillitis came on, followed by acute articular rheumatism. Endo-

carditis, pericarditis, and pneumonia supervened, and the patient died. The articular rheumatism from the commencement showed signs of pyæmia.

The intimate connection which exists between the throat and acute rheumatism is shown by the frequency with which tonsillitis precedes or accompanies an attack of acute rheumatism. I think that there is a great deal to be said in favor of the view that tonsillitis is a primary infective disease of the lacunæ, and that rheumatic fever is a secondary disease arising from the absorption of microbes or their products into the system. I have recorded a typical case of acute pericarditis occurring in a child with acute lacunar tonsillitis but with no other symptoms of rheumatism. I think, therefore, that clinically we may regard acute multiple articular rheumatism as an infectious disease, which runs the course of an attenuated pyæmia, and that in a large number of cases the infection enters the system through Waldeyer's pharyngeal ring, especially the faucial tonsils.

The inflammatory reaction in the tonsils to which the name of lacunar tonsillitis is given, may be regarded as the evidence of the local action of the micro-organisms causing the disease. On the other hand it is quite possible that in the future we shall be able to distinguish bacteriologically various forms of tonsillitis. One, for instance, associated with acute rheumatism, and another giving rise to endocarditis, from absorption of toxins, but quite unconnected with rheumatism.

And yet another view is possible, namely, not to regard the tonsillitis as in any way due to rheumatism, but as affording a mode of entrance into the system of the germs which give rise to rheumatism. Before this question can be definitely settled we need to know more of the cause of rheumatism. If the suggestion be true, then the importance of careful antiseptic treatment of all sore throats, howsoever mild they be, is accentuated. Septic and pyæmic processes may be the result of infection through the upper respiratory tract.

In October, 1898, I saw, in consultation with Mr. W. G. Spencer, a case of acute pharyngitis due to streptococcus pyogenes; this was followed by septicæmia, deep glandular inflammation, and pericarditis. The patient had four injections of antistreptococcus serum and made a good recovery. In March of this year I was called into the country to see a medical man who had been tracheotomized the previous day. I found enormous swelling of the epiglottis and right aryepiglottic fold, no pulmonary or cardiac affection. Pulse 120, very feeble; temperature ranging between 101° and 99°; urine albuminous. One of the inmates of the house had died a week previously, evidently from septic pneumonia, and another died the day after my visit, also from some septic condition. The house was found to be in a most insanitary state. Though I was unable to get a bacteriological examination I decided to use antistreptococcus serum. The immediate effect of the subcutaneous injection of 10 c.cm. was so satisfactory that it was determined to continue its use, 80 c.cm. being the total amount employed. The patient had a patch of lobar pneumonia, followed by empyema, for which he had a portion of rib resected, but eventually made an excellent recovery. I

take it that this was a case of primary infection of the larynx, probably by the streptococcus pyogenes. In my Lettsomian Lectures I pointed out the important role played by chronic nasal affections in the production of facial erysipelas. These affections, by impairing the nutritive activity of the epithelium and leading to its desquamation, allow the streptococcus erysipelatis an access into the system.

In a paper which I presented at the meeting of the Association in 1891, I quoted various authorities in favor of the view that non-traumatic œdema of the larynx is always the result of erysipelas, and that infection occurs through fissures in the epithelium or through abrasions of the surface. Hence the upper respiratory tract should be regarded as of great importance in the spread of erysipelas, and not only erysipelas but also conditions such as angina Ludovici, phlegmon of the pharynx and larynx may, as Sir Felix Semon has pointed out, have a common origin.

O. J. STEIN records a case of chronic catarrhal rhinitis in which an acute exacerbation occurred. The abundant purulent discharge contained the steptococcus erysipelatis. A few days later a widespread erysipelas of the face developed. This case illustrates the importance of a bacteriological examination of the nasal secretion.

The question of the infection of the system by tuberculosis is too wide for me to do more than touch its fringe. Though nasal tuberculosis is usually found in patients suffering from pulmonary or general tuberculosis, yet cases are occasionally met with in which no pulmonary or other tuberculous lesion can be detected. I say advisedly "can be detected" because all physicians with clinical experience are fully conversant with the difficulty which exists in affirming that the lungs are free from tuberculosis. Admitting, as I am prepared to do, that in some of the cases of nasal tuberculosis the lesion in the nose represents the primary seat of invasion, then the later development of tuberculosis in the lungs and other organs will be an example of secondary systemic infection. From Mr. F. J. Steward's careful paper in *Guy's Hospital Reports*, vol. liv, it would appear that the proportion of primary cases of nasal tuberculosis is much greater than has hitherto been generally supposed. What I have just said about primary nasal tuberculosis applies with even greater force to primary laryngeal tuberculosis. Its possibility has been rendered certain by the discovery in a few cases, at the necropsy, of tuberculous disease of the larynx without any deposit in the lungs. With this evidence before us, we are justified in assuming that in exceptional cases tuberculosis may start in the larynx, and that the lungs may be secondarily affected. In the great majority of cases, however, the converse holds good, the larynx being involved by infection from the lungs.

One of the most important advantages which has been made of late years in regard to the diffusion of tuberculosis is the recognition of latent tuberculosis of the tonsils. In a very suggestive address delivered by Dr. Sims Woodhead he reviewed the various portals of entrance into the system of the tubercle bacillus, and summed up as follows: "I am driven to the conclusion that this method of infection of the glands of the neck through the tonsils must be of compara-

tively frequent occurrence, especially in children living under insanitary conditions, and subjected to various devitalizing influences."

In the first edition of my work on the *Diseases of the Nose and Throat,* before I knew anything about the possibility of tuberculous infection of the glands of the neck through the tonsils, I pointed out that in cases of enlarged tonsils the cervical glands were almost always enlarged. This fact was the common property of all who had devoted attention to the diseases of the throat, but in my Lettsomian lectures I went a step further, and said, "Tubercle bacilli can probably pass through the tonsils, and, without giving rise to any disturbance in them, may produce tuberculosis of the glands of the neck."

The observations of M. Dieulafoy in France, and Dr. Hugh Walsham in this country, to cite only two well-known investigators, have placed on a firm basis the connection between tuberculous glands of the neck and enlarged tonsils.

Until the last few years it was generally held that the tonsils were but rarely affected with tuberculosis, and then usually only superficially as the result of extension from pharyngeal tuberculosis, but Dr. Hugh Walsham has shown that out of thirty-four consecutive *post-mortem* cases the tonsils were found to be more or less tuberculous in twenty. The examination of enlarged tonsils and of adenoids removed during life has not had equally marked results. The discovery of the liability of the tonsils to tuberculous infection has thrown quite a new light on the subject of tuberculous disease of the cervical glands, and emphasizes the importance of removing enlarged and honeycombed tonsils by means of which all kinds of noxious germs may enter the system. The tonsils probably become infected by tubercle bacilli in children, who crawl about and get their hands covered with dust and dirt, and then infect themselves by sucking their fingers. Sucking dirty toys is another possible source of infection. Some bacilli may gain access to the tonsils in swallowing tuberculous milk; or, in respiration, the air containing the bacilli may deposit them on the surface of the tonsils. From what I have just stated, the potentiality of the tonsils as a source of tuberculous infection is very great. Not only are the faucial tonsils the seat of primary infection by the tubercle bacillus, but also the pharyngeal tonsil may be the part first affected.

According to one authority, in 5 per cent. of the cases of enlarged pharyngeal tonsils there are tuberculous foci. The recognition of the tuberculous nature of some adenoid vegetations and the possibility of the system becoming infected through them should constitute an additional reason for the prompt and complete removal of these growths. If they are infected with tubercle it would almost be better to leave them alone than only partially remove them, as partial removal might the more speedily lead to tuberculous infection of the system. It has been shown that pulmonary tuberculosis is essentially a "filth" disease, that is, that it depends on impure air. The aerial dangers are three in number; first, the presence of tubercle bacilli, without which, of course, tuberculosis could not arise; secondly, dust in the air; and, thirdly, gaseous impurities. Dust in the air, especially minute fragments of mineral matter, by damaging the

epithelium of the air passages, allows a point of entrance to the bacilli, and gaseous impurities, especially carbonic dioxide, by diminishing the protective power of the lymphatic glands favor the growth of the bacilli.

If time had permitted I might have directed attention to the entrance of other infectious diseases via the upper respiratory tract, but I think that I have brought forward sufficient material to give rise to a useful discussion, especially as I am to be followed by Dr. Jobson Horne.

DR. JOBSON HORNE said: It is unnecessary to dwell upon the importance of the subject under discussion, its importance is rivaled only by the vastness of the field it covers, and this will become apparent as the discussion develops. An increasing recognition of the part played by the upper respiratory tract as a source of systemic infection must be attributed, I think, to the improved methods of clinical analysis in modern medicine, a natural concomitant of the growth of specialism.

It would be idle, and, after the exhaustive paper by Dr. de Havilland Hall, it is unnecessary, for me in the present communication to attempt to pass in review in the brief time at my disposal the vast range of diseases gaining admittance to the body through the portals which fall within the domain of our practice. It would be equally idle for me to attempt to discuss any one of these diseases in all its amplitude.

All that I propose doing is to invite your attention to the consideration of a few diseases of obscure origin and insidious onset, which, I believe, more frequently than is commonly thought, have their origin in the upper respiratory tract. The diseases to which I propose alluding are infective endocarditis, tuberculosis, lymphadenoma (Hodgkin's disease), and lymphosarcoma.

The term "infective endocarditis" in its usually accepted and restricted sense, meaning the malignant, ulcerative, or septic phase of the disease, is perhaps, in the light of our present knowledge, no longer tenable, for we know that acute endocarditis, inasmuch as it is associated with one or other of the infective diseases, is always infective in nature. The cases I am about to refer to, however, belong to the more malignant and destructive variety in which the septic process is by no means confined to the heart, but the stress of the disease is upon that organ.

The part played by the faucial tonsils in rheumatic fever, and therefore in acute endocarditis, has already been submitted for your consideration, and I need not dwell upon that point.

I pass down to the larynx, a breach in the mucous membrane of which may be the site of entry of the parasite which will bring about the destruction of the patient. Do not let it be thought for one moment that I am desirous of establishing the larynx to the exclusion of other sites of infection as the *fons et origo* of this disease, or of any of the other diseases to which I shall allude. I merely give you *post-mortem* room facts and clinical observations which cannot be lightly passed over.

It is now nearly ten years since I first observed a case of malignant endocarditis in which the primary infection was in the larynx. It occurred in a man aged 57; at the necropsy the cusps of the mitral and aortic valves presented vegetations and ulcerations, the larynx in its left half was swollen and sloughy, and the left arytenoid cartilage was necrosed and exfoliating. The lesions in the larynx were so gross as to leave no doubt about it being the primary site of infection.

More recently I have had the opportunity of observing a similar case, the larynx from which is in the Museum at St. Bartholomew's Hospital, and through the kindness of Dr. Andrewes, the Curator, I am able to show you a photograph, in which it will be observed that both arytenoid cartilages are necrosed and exfoliating. The laryngeal lesions in these two cases were so advanced that it was difficult to indicate the precise site of infection. I have, however, a larynx from another case, a younger subject of malignant endocarditis, in which death occurred at an earlier stage and which shows the starting point of the ulceration. This point is in a fold of mucous membrane commencing behind the vocal process and passing obliquely upwards and backwards, to be lost between the summits of the cartilages of Santorini and Wrisberg. I find this to be a site which lends itself to infection in other diseases about which I shall speak; here secretion may rest and stagnate, and here stress and strain is put upon the laryngeal mucosa, and a breach in an inflamed surface could readily occur. I shall refer to it as the vulnerable spot.

The upper respiratory tract as a source of tuberculous infection may be considered under three headings:

First, it may be the site of direct infection. I use the term in contradistinction to indirect infection, which I shall almost immediately explain. A tuberculous lesion in this region may be the outcome of direct infection by the virus from outside the body—as, for example's sake, in primary tuberculosis of the nose, the fauces, the post-nasal adenoid tissue, the soft palate, the pharynx, the parotid gland, the tongue, the larynx, and the ear; all of such primary infections, with the exception of the last, are comparatively rare. On the other hand, the lesions may be the outcome—and this is more commonly the case—of direct inoculation with sputum from the lungs, in which case, of course, the infection is a secondary one, and in illustration of this I would instance secondary tuberculosis of the larynx and the ear; primary tuberculosis of the larynx is so extremely rare that it is a negligible quantity. The diagnosis of such a condition, for obvious reasons, can only be based upon *post-mortem* evidence. In the course of ten years, whilst closely following the necropsies of a large general hospital, I have never met with a single case.

From deadhouse observations I feel that I am now in a position to make the following statements with reference to tuberculosis of the larynx:

1. When the larynx is infected with tubercle the disease is already established in the lungs.

2. That by the time the disease in the larynx has advanced to ulceration the disease in the lung has advanced to cavitation.

3. When the disease in the lung is confined to the pure miliary form the larynx is never infected.

These statements are uttered with a degree of dogmatism to which I am seldom given. The deduction to be drawn from them is obvious—that infection of the larynx takes place by the sputum. The bearing of these observations upon the so-called cure of laryngeal tuberculosis by means of surgical treatment must be equally obvious.

Infection of the ear by the sputum I have dwelt upon so recently in a discussion at the Otological Society that I think I need not detain you on that point.

I would refer here to a matter of controversy which closely concerns our discussion—namely, the relative potency of the virus of tuberculosis in its dry and moist forms. Without entering into any discussion about the propagation of tuberculosis, I think we may assume it is generally agreed that the spread of the disease is to be mainly attributed to the particles of sputum from phthisical patients. Cornet and his school hold that the sputum is most dangerous when it has become dry and pulverized. Flügge maintains that the sputum is more infectious in the moist form, as in the spray produced in coughing and sneezing. Numerous experiments have been done by these two schools in support of their respective views. Let us consider what light is thrown upon the subject by the references I have made to tuberculosis of the ear and larynx. Both of these regions are exposed to infection through the agency of an atmosphere charged with tuberculous dust, yet it is extremely rare to meet with tuberculosis primary in the larynx by direct infection from the air inspired. It is equally rare to meet with tuberculosis in the ear starting from the external meatus. On the other hand, evidence has been adduced to prove that infection of both these regions must be attributed to sputum direct from its mother soil being lodged against the mucous membrane of the larynx and about the orifice of the Eustachian tube. These facts seem to me to strongly support the view advanced by Flügge.

Tuberculous ulceration when it occurs in the trachea is usually more marked on the posterior wall, and is met with in subjects of advanced phthisis who have become bedridden. Doubtless the prolonged contact of a tenacious agent such as sputum fully explains the etiology and situation of the lesions observed.

Secondly, the upper respiratory tract as a path of indirect infection in tuberculosis—by that I mean infection through the upper respiratory tract without any naked eye or positive microscopic evidence of the path being left behind.

Lymphoid tissue of all tissues is most vulnerable to tuberculosis, and yet how difficult it is to demonstrate tubercle bacilli in excised tonsils, post-nasal adenoids or lymphatic glands. Were one to diligently examine with the microscope excised tonsils and adenoids, cutting series of sections through the entire structure, the reward for one's pains would be to find giant cell systems in about 4 per cent and tubercle bacilli in rather less than 1 per cent of such examina-

tions, notwithstanding the fact that the material may have been taken from cases of tuberculous adenitis and, perhaps, primary tuberculosis of the middle ear. This is an important pathological fact, to which I shall revert.

That a systemic infection with tuberculosis does take place through the lymphoid ring of the upper respiratory tract is beyond question. It was demonstrated by Sims Woodhead in his experiments on swine, which showed that the lungs could become infected through the cervical glands by feeding with infected material. It is, of course, difficult to demonstrate the truth of this in the human subject.

The preceding considerations bring me to my third proposition, namely, the part played by the lymphoid tissues in modifying or preventing a systemic infection. Call to mind the cases of tuberculous adenitis in which the disease is restricted under hygienic measures to the cervical glands. Infection in such cases must have taken place through the upper respiratory tract. Couple with this clinical observation the pathological difficulty in demonstrating tubercle bacilli in the lymphoid tissue from these regions. We are then driven to consider whether the bacilli, having set up a morbid process, may, through some property of the tissue, perish or become crippled amidst the lesions they have engendered, and the systemic infection may thereby become arrested, or, at least, modified in its progress.

This brings me to the consideration of another disease, namely, lymphadenoma or Hodgkin's disease. I prefer using the latter term in the present state of our knowledge. It is comprehensive and noncommittal in sense. Far be it from me to provoke a discussion here as to whether lymphadenoma is or is not tuberculous. At present I recognize in it a histological, but not a pathological, entity. As regards the etiology, it has long been surmised that Hodgkin's disease is due to an infection. When we bear in mind that, so far as it is possible to ascertain, Hodgkin's disease has commenced in the glands of the neck in at least 50 per cent of the cases recorded, and also that the tonsils themselves are not infrequently affected in this disease, it is reasonable to point to the latter structure as a probable point of entrance of the infecting agent, whatever it may be. I have already published cases demonstrating ulceration of the larynx as a point of entrance of the infecting agent[1] and I think the evidence brought forward in those cases is ample to indicate the necessity of examining the larynx as a possible site of infection in the diseases grouped under Hodgkin's name.

Lastly, I wish to refer to a case of thoracic lymphosarcoma which occurred in a man aged 49. At the necropsy it was found that the mediastinum contained a considerable mass of new growth, presenting the macroscopic appearances of a lymphosarcoma. The main bronchus on the right side, although not invaded, was decidedly compressed, but not occluded by the growth; the œsophagus had been impinged upon to an extent of 4 inches, and for about 2 inches had been seriously narrowed. The gland at the bifurcation of the trachea was greatly enlarged, and appeared to be the starting point of the growth. The anterior and posterior glands in the mediastinum were involved. The other glands in the body were not obviously affected.

The right lung near its root contained a secondary deposit of the circumference of a penny-piece. No microscopic evidence of tubercle was met with in the lungs or in any part of the body. The liver and spleen were free from new growth. The larynx, on the outer side of the right arytenoid region, presented a circumscribed area of œdema about the size of a raisin. On the inner aspect of the right arytenoid there was the puckered scar of an ulcer, situated immediately below the cartilages of Santorini and Wrisberg, in the situation I have referred to as the vulnerable spot.

Under the microscope the case was found to be one of sarcoma—that is to say, histological round-celled sarcoma was present, both in the growth and in the secondary deposit in the lung. After all "sarcoma" is but a mere term, and conveys no more precise information about the nature of the case than the term "lymphadenoma" would afford about that of others I have referred to.

The presence of the ulcer in the larynx in this particular case raises the interesting question whether the growths were not the result of a systemic infection, and whether sarcoma may not eventually have to be numbered, together with the lesions met with in Hodgkin's disease, amongst the infective granulomata.

Before concluding, I wish to thank our President for his address eloquently appealing for a compulsory training of students in laryngoscopy. In my brief remarks I have only touched upon a very small part of a subject of vast importance in general medicine, and that I have done imperfectly; but I trust what little I have said will be held to be further evidence in support of our President's appeal. *Non cuibis hominis contingit adire Corintham.* To behold Corinth was to the civilized Roman the acme of culture. Let us hope that in the near future our appeal will be heard, and that we shall cease to have cause to sing. *Non cuibis medico contingit adire laryngem.*

Dr. Goodale said the object of the following paper is to discuss certain chronic disturbances of the system, arising through the absorption of bacterial products from the lymphoid tissue of the upper respiratory tract. We have here to do with conditions which are essentially different from those occurring in acute infections. In the former class of cases the pathogenic micro-organism invades the tissues, either in virtue of its virulence, or as a result of the temporary lowering of the resistance of the organism. In the chronic conditions, on the other hand, alterations have occurred in the histological or anatomical structure of the tissues, which permit the development on or in them, of saprophytic bacteria, and the disturbances produced are due to the absorption into the system of products of decomposition.

In order to understand the etiology of these conditions it will be necessary to bear in mind certain histological points relating to the structure of lymphoid tissue. I will remind you that the unit of lymphoid tissue is the follicle, a collection of lymphoid cells enclosing a central endothelial reticulum. These units are separated from each other by an endothelial network containing lymphoid cells, plasma cells, and cells of a type intermediate between these two. The sur-

face of this tissue is formed by mucous membrane, squamous or columnar, of considerable density, equaling, at least in compactness, the mucous membrane of the vicinity. In the pharyngeal, faucial, and lingual tonsils the stout mucous membrane of the free surface forms invaginations, which are lined with comparatively loose mucous membrane. This is the important circumstance which renders these organs points of inferior resistance against the invasion of micro-organisms. Fluids and finely-divided particles, in contact with the compact epithelium of the free surface of these tonsils, penetrate with difficulty, or not at all. When introduced into the crypts, they have been observed to penetrate the intercellular deficiencies of the lacunar epithelium, and travel with the efferent lymph stream, between the follicles, towards the capsule of the organ, and even into the cervical lymph glands. The situation of these tonsils is thus seen to be an important factor in determining the method of resistance against bacterial invasion. The pharyngeal tonsil is situated in a region in contact with air which has already been filtered nearly or quite free of bacteria. The secretion of the numerous mucous glands of the vicinity acts as a protective covering to prevent the direct contact of micro-organisms against the mucous membrane. Finally, the invaginations of the mucous membrane present little or no opportunity for the retention and decomposition of substances in contact with them. In the case of the lingual tonsil the lacunæ are comparatively short and wide-mouthed, while a constant stream of fluid is passing by with each act of swallowing. Retention and decomposition of the lacunar contents is thus practically impossible. In the faucial tonsils, on the other hand, a variety of factors come into play in determining this question. Under normal circumstances the crypts are irrigated by saliva and other fluids with almost the same degree of thoroughness as in the case of the lingual tonsil. The leucocytes and cellular detritus of the crypts have thus no opportunity to accumulate.

Under certain conditions, however, free egress from the lumen of the crypt is restricted and decomposition of its contents ensues. The two chief factors in causing this condition are acute inflammation and retrograde metamorphosis.

As shown by the writer, acute tonsillitis is characterized histologically by a diffuse inflammation of the parenchyma of the organ, appearing in the form of an increased proliferation of the lymphoid cells and of the endothelial cells of the reticulum, due to the absorption of a toxin formed in the crypts. The crypts are filled with exfoliated epithelial cells, leucocytes, bacteria, amorphous debris, and in some cases fibrin. The leucocytes are chiefly polynuclear neutrophiles, many of which contain bacteria in their interior. Some show nuclear fragmentation, with dispersion of their chromatin. There are also seen smaller numbers of lymphoid cells, plasma cells, and cells intermediate in character between these two.

Of chief importance in the present connection is the different degree of intensity of the process in the distal and proximal portions of the crypts. Bacteria are abundant near the orifice of the crypt, gradually diminishing towards the base, which at times seems nearly

free from them. The phagocytic leucocytes correspondingly near the orifice of the crypt exhibit the greatest number of incorporated bacteria. In cases of especial clinical severity, fibrin is seen along the walls of the lacunæ near the orifice, as a delicate network enclosing cells and bacteria. In the deeper portions of the crypt fibrin occurs only in exceptional cases. We thus see that in acute tonsillitis the activity of the process is chiefly manifested near the distal portion of the crypt. It is thus evident that denudations of the epithelium and adhesions of the opposite walls would occur more readily near the orifice of the crypt than near its base. If the adhesions completely occlude the orifice of the crypt, a cyst-like cavity is formed in the tonsil. If this cavity is free from bacteria, it will exert no further influence upon the system, except, possibly, through pressure. If, however, the occlusion is not complete, but permits the entrance of saprophytic bacteria decomposition of the lacunar contents rapidly ensues. Inflammatory adhesions of the tonsillar folds to the surface of the organ may bring about the same result by partially closing the orifice of one or more crypts.

With regard now to retrograde metamorphosis, as age advances, contractions and alterations occur in the structure of the tonsil of great variety. The resulting condition depends upon the manner in which this sclerosis takes place. If the tonsil has been previously essentially normal it merely retracts more or less symmetrically into its recess between the anterior and posterior pillars. If, on the other hand, the crypts have been previously dilated, and if the free surface is more or less covered by adhesions and folds of membrane extending to the vicinity, the process of involution will be attended by an irregular narrowing of the lumen of the crypts. If the narrowing begins near the base of the crypt, and extends from this point outward, no harm will result, but if the narrowing, on the other hand, begins at the orifice, a bottle-shaped condition of the crypt will be produced, with resulting faulty drainage and decomposition of its contents.

In the histological examination of tonsils, which are the seat of putrefactive processes, we are struck first with the relatively large size of the endothelial center of the follicles. This enlargement is out of proportion to the number of lymphoid and plasma cells in the vicinity, and is due to increased proliferation of the endothelial cells lining the reticulum. In response to irritation these endothelial cells give rise to cells having the appearance of epithelial cells, but with phagocytic properties. Their phagocytosis is not only for amorphous detritus, but also for other living cells, chiefly red blood corpuscles and lymphoid and plasma cells. It differs thus from the phagocytosis exhibited by the polynuclear neutrophiles of the crypts, which is limited to micro-organisms and detritus. It differs, however, from the enlargement found in acute inflammation, in that there is no swelling of the cystoplasm of the endothelial cells of the blood vessels, or abnormal exfoliation. The proliferation and phagocytosis is to be regarded as the result of absorption into the interior of the tonsil of irritating toxines, produced by the saprophytic bacteria of the crypts.

In several instances I have found concealed terminal dilatations of the lacunæ. In these cases clinical examination showed a tonsil of modern size, with apparently normal crypts. After excision, however, a cavity was encountered, adjacent to the capsule, containing a large amount of fetid puriform fluid. The existence of such an accumulation may be difficult to recognize clinically, even after careful probing or division of the intra-lacunar tissue.

These conditions of saprophytic development, whether apparent or concealed, are sufficient to bring about a definite train of clinical symptoms, which may be briefly referred to. Pallor, impairment of strength and spirits, fetid odor of the breath, gastric disturbances of various kinds, are most frequently found. Abnormal susceptibility to acute infections is frequent. In two instances, I have seen obstinate acne of the face, which had been treated by skilled dermatologists for a number of years with but slight transitory improvement, show a complete clearing up of the skin, after a deep-seated, concealed, fetid collection had been removed from the tonsil.

Increased susceptibility to circumtonsillar abscess is a common phenomenon, and is usually attributed to the occlusion of the orifice of a cyst during acute tonsillitis with consequent damming up of its contents. In many, if not most cases, however, I believe that the extension of the suppurative inflammation beyond the tonsil is due to the rupture of an intrafollicular abscess into the efferent lymph channels. In the microscopic examination of acutely-inflamed tonsils, I have repeatedly found in addition to the ordinary phenomena of proliferation and exudation one or more follicles to be the seat of active suppuration. In other words, while acute tonsillitis ordinarily shows no penetration of bacteria from the crypts into the tonsillar tissues proper, a certain proposition of cases are characterized by the presence of intra-follicular foci of suppuration. The ordinary course of these intrafollicular abscesses is to rupture into the nearest crypt before attaining any considerable size. In five cases, however, of acute tonsillitis complicated by beginning circumtonsillar inflammation, microscopic examination of the excised tonsil showed a rupture of one or more intrafollicular abscesses into the efferent lymph channels, and chains of polynuclear leucocytes could be traced from the broken follicular ring as far as the capsule of the tonsil. It is to my mind an open question whether the penetration of the bacteria into tonsillar tissue is due to increased virulence on their part, or to a lowering of the powers of resistance of the organism, or to pre-existing local alterations in the tonsil itself.

Long-continued persistence of the bacillus of diphtheria in the throat appears in some instances to be due to chronic lacunar inflammation, and may under these circumstances be best treated by a complete clearing out of the tonsillar tissue. On theoretical grounds there should be no objection to this procedure if the system has been rendered either actively or passively immune to the disease, since the specific micro-organisms possess subsequently for the individual merely saprophytic and not pathogenic properties. It is, however, questionable whether the disappearance of the diphtheria bacilli under such circumstances is to be attributed to the removal from the throat

of what may be considered culture media, or whether it is due to increased vigor of the organism consequent upon the arrest of the long-continued absorption into the system of saprophytic poisons.

Finally, we have to consider tuberculous infection of the system through the portal of the lacunar epithelioma. In my experience, tuberculous cervical lymphadenitis is in a large number of cases associated with dilatation of the lacunæ, which on close inspection show a narrow hyperæmic halo about their orifice. The tonsils at the same time are not necessarily enlarged. Where the removal of such tonsils cannot be practiced, either on account of the general condition of the patient or his unwillingness to submit to operation, I believe that an attempt should be made to reduce the size of the lacunæ either by cauterization or by application of iodine, with the object both of securing better drainage and of rendering the lacunar epithelium more compact.

To recapitulate briefly I will say: Chronic absorption of the products of bacterial decomposition is unlikely to occur in the pharyngeal or lingual tonsil, but takes place with frequency in the faucial tonsils. In the faucial tonsils the chief factors favoring the development of saprophytic bacteria are antecedent attacks of acute inflammation, either alone or in association with processes of retrograde metamorphosis.

Histologically, the most conspicuous alterations are the endothelial proliferation and formation. Clinically, this condition is characterized by evidences of toxic absorption into the system. It appears to favor the development of circumtonsillar abscess after acute tonsillitis, also the persistence of the bacillus of diphtheria after an attack of this disease, and finally, the penetration of the bacillus of tuberculosis into the lymphatic system.

DR. POYNTON said: Dr. de Havilland Hall's able introduction of this important subject has dealt in particular with the clinical aspect. My intention is to deal very shortly with some pathological points. I think pathology has rendered very important service to medicine in putting on a sure basis the fact that general infection may commence by dissemination from the upper air passages. English clinicians have done much to pave the way to this knowledge on the pathological side. The early experimental investigations in Germany demonstrate conclusively that a streptococcus might be present in the throat in diphtheria which would produce with some constancy a suppurative arthritis in animals. Dr. Payne and myself made another step when we showed that a diplococcus could be isolated from a rheumatic angina, which would on intravenous inoculation produce the lesions of rheumatic fever in the joints, heart, pleuræ, and elsewhere, and which were present in those lesions in man. Then F. Myer and Menzer elaborated these early investigations and repeated them on a larger scale, so that now we know the stages in the process. 1. The micro-organisms get into the fibrous framework of the tonsils, and thence reach the minute blood capillaries and lymphatics so reaching the general circulation. In some cases the lymphatics appear to be the chief channel, and there is much enlargement of the

cervical glands, in other cases the chief channel appears to be minute blood vessels. 2. The micro-organisms have been isolated from the blood in man, and found in the local lesions. We are then on firm ground. I do not say as regards the specific nature of any micro-organisms, but as regards the fact under discussion, that a local focus in the upper air passages may be the cause of a general infection.

There is another very important, but disquieting, fact that is established by pathology. It is that in many instances when once the micro-organisms have gained access to the general system, they make themselves new homes in the tissues. Few experiments are more convincing than the production of severe endocarditis in a rabbit by the diplococcus from rheumatic fever. A fortnight afterwards if you cut a section of the valve you may find literally thousands of virulent micro-organisms there. It is clear, therefore, that local treatment of the upper air passages can only do a limited amount of good in infections of the rheumatic type, for each internal lesion is a local focus. But it holds good, as Dr. Hall has so well pointed out, that every effort should be made to arrest the process before it generalizes. I venture to think, nevertheless, that this great truth must be kept clearly in mind by those who are devoting their lives to a special study of the upper air passages.

A third, and equally important point, is that at present we really do not know why it is that micro-organisms probably always present in the throat, suddenly become dangerous. That border line between pathogenic and non-pathogenic is in my opinion the weak side of bacteriology at the present time. So far as rheumatism is concerned it is I think very probable that there is a rapid multiplication of the micro-organisms in rheumatic angina. Such has been my experience and that of some German investigators, but this does not answer the question why. Because of the obscurity of this most pressing question, I have always fought hard against any assumption that whether a sore throat is septic, or rheumatic or catarrhal is simply a question of the resistance of the patient. In opposition I maintain that we do not know when we look at such a throat, whether the fate of the patient turns upon his resisting powers or upon some special (specific if you prefer that word) properties in the infective agent.

Certainly I think we shall admit, so far as diphtheria is concerned, much rests with the micro-organisms, and though in those other infections so vaguely termed septic we are at present in confusion, I hold firmly to the view that when you have great clinical differences, then you have some special factor in the infective agent. I admit the factor of personal resistance, but not as the explanation of the great differences that there are between the illnesses that follow rheumatic, septic, and catarrhal sore throats. In the search for these differences, difficult and slow though it may be, lies the hope of the discovery of the special poisons and their antidotes. In the massing together of these conditions as septic lies, in my opinion, the danger of a false confidence and imperfect methods of treatment.

There is one practical point which I have met with and which perhaps is worth alluding to. On several occasions I have seen rheu-

matic fever directly follow tonsillotomy, though I do not say as cause and effect. When I say directly follow, I mean within a week of the operation, the patient being apparently in good health when the operation was done. So far as advising operation for rheumatic patients with diseased tonsils—and there are many such—all that can be said is, if their removal is for the general good of the patient it is right, but it will not prevent further attacks except in so far as improving the health protects against many infections.

The last point to which I should like to allude is this, that very probably infection from the throat may occur without any appreciable local symptoms. It is generally admitted that the most severe puerperal fever may occur from uterine infection with scarcely any local disturbance. The virulence of the infection is such that the unfortunate patient is in the position of an animal intravenously injected with micro-organisms. The same seems to occur in the throat. This is a great practical difficulty both in treatment and in getting an accurate idea of the frequency of infection from the upper air passages. The local inflammation is only a measure of the local disease, and not of the tendency to general infection, acute leukæmia, and the throat. My remarks I am afraid are somewhat limited in their scope, and have not the advantage of a special knowledge of the upper air passages, but I should like to add that the subject appears to me a most important one, and I am much obliged to the President and Secretaries for giving me this opportunity of hearing and taking part in it.

(*Concluded in next issue.*)

Teratoma of the Ear.—Wm. C. Braislin (Brooklyn.)—*Brooklyn Med. Journ.*, July, 1903.

This growth appeared in a female 50 years of age. Tinnitus was the chief symptom present, which prevented sleep. This symptom had originated about two years previously. Later on absolute deafness set in, but the ear itched and a hair pin was employed to relieve this symptom. The growth completely blocked the canal; not even a very small probe could be passed through the external auditory canal. The attachment was at the superior aspect of the canal. An exploratory incision was followed by a brisk hemorrhage, which caused tentative diagnosis of angioma.

The usual mastoid incision was made, and the auricle was drawn forwards. The growth was found attached to the periosteum, enclosed in a capsule, being readily removed.

The microscope revealed cartilage and myxomatous tissue and abortive glands.

One pathologist termed the growth an endothelioma. Audition was much improved; so was the tinnitus. M. D. L.

THE LARYNGOLOGICAL SOCIETY OF LONDON.

Eighty-Fifth Ordinary Meeting, November 4th, 1903.

J. CHARTERS SYMONDS, F.R.C.S., Vice-President, in the Chair.

The following cases, specimens, and drawings were shown:

Drawings of Localized Psorospermosis of the Mucous Membrane of the Septum Nasi.

Shown by MAJOR O'KINEALY, I.M.S. A microscopic specimen and report of the first case of this condition, discovered by Major J. C. Vaughan, I.M.S., and the exhibitor in 1894, were brought before the Society in April, 1903.* He was now able to show three drawings of other cases through the kindness of Major F. J. Drury, I.M.S., the Professor of Pathology at the Medical College, Calcutta, to whom also, with Lieutenant-Colonel G. Bomford, I.M.S., the Professor of Medicine, he was indebted for further information. The drawings accurately depicted the clinical appearances of the growth and the microscopic structure of a fresh section of it.

Since the original case, about seven or eight others had been seen at the Medical College Hospital, and most of them by Captain T. B. Kelly, I.M.S., to whom was due the credit of recognizing the disease by its clinical appearances. It had only been met with in natives, no common cause had been discovered for the presence of the parasite, and it seemed to be confined to isolated cases, as none of the patients had been aware of any similar affection among their fellows. Epistaxis was practically the only symptom complained of, and the growths bled very readily. They apparently occupied the same position on the anterior part of the cartilaginous septum in all cases and had the appearance of a strawberry or a raspberry, or perhaps still more of an arbutus berry.

Captain Kelly had found removal of the tumor, with cauterization of the base to be the best form of treatment, and appeared to have had no complaints of recurrence since the adoption of this plan.

A section of the growth when fresh was seen to be studded with minute white dots, which under the microscope were found to be cysts filled with granular bodies. Each of these bodies contained about a dozen refractile granules, and there seemed to be a pore in the cyst wall through which the bodies escaped into the surrounding tissues.

So far as could be ascertained, this species of sporozoon had hitherto not been known in man. Its proper place among the

*"Die Protozoen als Krankheitserreger."

Sporozoa had not yet been determined, and the opinions of those who had seen it differed as to whether or not it should be classed with the Coccidia. Pfeiffer, in his work on the Protozoa,* described a somewhat similar parasite in the tench, and classified it with the Myxosporidia.

Drawings of a Large Piece of Bone removed from the Larynx of a Boy.

Shown by MAJOR O'KINEALY, I.M.S. The patient, a German Jew, æt. 5 years, came into the Presidency General Hospital, Calcutta, from Singapore, on the 20th November, 1899, with the history that about five months previously a piece of bone had stuck in his throat while he was eating some stewed duck. As a result of this there was marked dysphagia and pain in the throat, which gradually passed off after about ten days, but his voice had been permanently reduced to a whisper.

On admission the child could not speak above a hoarse whisper, and his breath was offensive. Laryngoscopic examination showed a white body, about a line in breadth, lying in the antero-posterior diameter of the larynx, midway between and slightly above the ventricular bands, and extending from just below the cushion of the epiglottis to the middle of the upper border of the interarytænoid fold. When examined with the probe, it felt like a piece of bone, and was found to be firmly fixed at both ends, where it was embedded in pink nipple-shaped masses of thickened tissue. The thickening was greater anteriorly, where the foreign body was more firmly impacted, and there extended downwards between the ventricular bands. Both vocal cords were congested, but moved freely. Below the left cord, and parallel to the foreign body, lay another white linear body, which looked like a second piece of bone.

The body was removed by the endolaryngeal method under cocain anæsthesia, and some force was required to dislodge it. The measurements of the bone were—length three-quarters inch, width at base five-eighth inch, thickness at base one-tenth inch, thickness inclusive of ledge one-quarter inch, thickness in other parts one-twentieth inch. The boy rapidly regained his voice, and left hospital on the 29th November, 1899.

When the age of the child and the size of the foreign body were considered, it was interesting that so little trouble should have been caused by its five month's impaction in the larynx, a result doubtless due to the position in which it lay.

Report of a Case of Unilateral Fibrinous Rhinitis.

Shown by MAJOR O'KINEALY, I.M.S. A Eurasian boy, æt. 4 years, was admitted into the Presidency General Hospital, Calcutta, on the 7th June, 1900, with a history of purulent discharge from the left nostril and pain of about seven days' duration. The child occa-

* "Proc." vol. x, p. 109.

sionally suffered from fever, and about a month previously caught a slight cold, which was followed by a little running from the nose.

On admission the left nostril was completely blocked by some foreign substance, and was full of muco-purulent discharge. The right nostril was clear and healthy, as was the remainder of the respiratory tract. The submaxillary glands were slightly enlarged and tender, the temperature was between 99° and 100°, and there was a little albumen in the urine.

On removal the obstruction was found to consist of a solid fibrinous cast of the left nostril, yellowish white in color, covered with muco-purulent secretion, and about two inches long. There was slight bleeding after it was removed. No antitoxin was used, and the child rapidly recovered under internal tonic treatment with an alkaline nasal douche. There was at first a good deal of discharge from the nostril, occasionally blood-stained, with some tendency to the formation of membrane, which, however, soon stopped, and the glands subsided. The temperature, which never went above 101.4°, fell to normal in a few days, the albuminuria disappeared, and the boy left hospital on the 19th June, 1900. When seen subsequently he was quite well, and none of the household had suffered in any way.

The fibrinous mass was unfortunately thrown away without being examined, but Dr. J. Nield Cook, the Health Officer of Calcutta, kindly made bacteriological examinations of the discharge and the membrane that re-formed. No Klebs-Löffler bacilli could, however, be discovered. Despite this negative result, the albuminuria and other constitutional symptoms point to the conclusion that the case was in reality one of mild nasal diphtheria, such as many other cases of so-called fibrinous rhinitis have proved to be.

Report of a Case of Membranous Tonsillitis in a Child Suffering From Plague.

Shown by MAJOR O'KINEALY, I.M.S. A Eurasian boy æt 3½ years was admitted into the European General Hospital, Howrah, on the 29th March, 1902, suffering from fever of about twelve hours' duration. The child came from a plague-infected neighborhood, and immediately after admission he had an attack of convulsions with diarrhœa,, and a rise of temperature to 104.2°.

On the 1st April moist sounds were heard in both lungs, having started in the left lung the day before, and a couple of enlarged and tender glands made their appearance, without any obvious local cause, below the angle of the jaw. The following day the glands were larger, and had fused into a hard painful mass, and a yellowish-white adherent membrane was seen to cover the right tonsil. An injection was given of 5 c.c. of serum, representing 1000 units of diphtheria antitoxin, and the throat was treated locally with sublimate lotion (1 in 1000), with the result that the membrane gradually disappeared.

Meanwhile, however, the general condition of the child became graver, and he developed definite symptoms of plague. Bubonic swellings successively appeared in the right side of the neck, in both

submaxillary regions, below and behind the left ear, and in both groins, accompanied by acute lymphangitis of the right thigh. Albuminuria and double broncho-pneumonia set in, the diarrhœa persisted, and the temperature, which had remained high since admission, ranged from 100.4° to 105,° only once falling to 98° for a short time; while the pulse rate and respirations increased to between 132 and 144, and 44 and 64 a minute respectively, and the child died on the 14th April, 1902, in spite of all treatment. No bacteriological or post-mortem examination was made.

It is known that inflammation and ulceration of the tonsils and pharynx occur in plague;* a diphtheroid pharyngitis has also been noted in the later stages of the disease, and is looked upon as a very grave sign.† In the present case the circumstances were different, inasmuch as the membrane appeared on the tonsil at an early period, before the diagnosis of plague was fully established, and gradually disappeared after the use of diphtheria antitoxin. The patient undoubtedly died from plague, and the question therefore arose whether his case should not be regarded as a double infection of diphtheria and plague, originating in the tonsil, rather than a diphtheroid condition arising from the latter disease.

Case of Laryngeal Disease in a Man of Fifty-one and a half Years of Age Showing Extensive Ulcerative and Hypertrophic Changes; for Diagnosis.

Shown for Dr. Scanes Spicer. This case was shown at the meeting of this Society on April 12th, 1901 ('Proc. Laryng. Soc.,' vol. viii, pp. 106-7). Of the suggestions offered—(1) an exploratory thyrotomy, and (2) a course of mercurial inunction, combined with larger doses of potassium iodide—the patient elected the latter. In a few months the thickened appearance of the posterior wall disappeared, and the left cord regained its mobility. The patient kept well for eighteen months. Early in the present year a small warty mass appeared on the right cord, together with general thickening, reddening, and variable œdema of the whole left side of larynx and epiglottis. In spite of the resumption of the antispecific treatment this persisted, and was followed by ulceration of the left side of epiglottis and left half of tongue; this had not been arrested by cleansing sprays, or insufflations of orthoform or iodoform. No tubercle bacilli were found on examining sputum, and there were no enlarged glands or cachexia. The last few weeks there had been some pain and dysphagia. The appearances were quite equivocal, and the case was shown to elicit opinions as to the nature of the condition and suggestions for treatment. Dr. Scanes Spicer himself suspected malignancy, but doubted the expediency of excision on account of the extensive involvement of the epiglottis and of the left half of the larynx. The case well illustrated the difficulties which beset the diagnosis of laryngeal neoplasms in certain instances, even although under constant observation.

* Jennings "A Manual ofjPlague."

† Scheube "The Diseases of Warm Countries."

MR. W. G. SPENCER thought it was a case of hypertrophic tubercle

MR. P. DE SANTI said that he showed a case to the Society some years ago very similar to this, and well known to various members. The patient had chronic tuberculosis, and so much stenosis that tracheotomy had to be done; he lived for nine years afterwards. On many occasions his sputum was examined, but no bacilli were found. He himself saw him for a period extending over seven and a half years; the man was also known to professors abroad. There was a great difference of opinion as to the diagnosis. Eventually he died of a sharp attack of acute tubercle, and there was no doubt it was a form of chronic tuberculosis from which he had suffered. He had syphilis in Japan, and it was a question whether the case was not a mixture of tubercle and syphilis. A similar explanation might apply to Dr. Spicer's case.

DR. STCLAIR THOMSON, judging from the appearance only, considered the case one of tuberculosis in a syphilitic subject.

SIR FELIX SEMON agreed with the opinion that it was a mixture of tubercle and syphilis. It might be a kind of hyperplastic form of syphilis, which recurred from time to time and disappeared under the use of antispecific remedies. What induced him to believe the case was a mixture was the appearance of the epiglottis, which was more like a syphilitic than a tubercular ulcerating tumefaction.

DR. SCANES SPICER said the patient got practically well on one occasion on antispecific treatment, and continued so for eighteen months. The thickening and ulceration then came on again rapidly, and more extensively than before. In reply to Mr. Spencer he said that a negative result had hitherto followed examination for tubercle bacilli.

DR. TILLEY and MR. LAKE regarded the condition as probably epithelioma, and advised radical extirpation of the diseased tissues.

Case of Operation for Rupture of the Trachea.

Shown by MR. CHARTERS SYMONDS. Mr. M., æt. 30, while riding a bicycle in September, 1899, ran into the pole of a van. He was unable to state exactly what happened. There could be no doubt that he had received a heavy blow in the neck, either from the pole of the van or the handle-bar of the bicycle. When brought home he had great pain in the neck, was unable to lie down, and expectorated blood. Emphysema appeared in the neck and chest, and lasted for about eight days. There was an irritating cough, which was relieved on the fifth day by the expectoration of a slough. No cartilage was found in the slough.

In October the breathing became difficult, and stridor appeared. In November he had an attack of acute pneumonia. The distress of breathing was greatly increased by the tracheal obstruction.

On November 21st he was seen in consultation with Dr. Craig. The voice was clear, indicating that the larynx had not been injured. On moving about he breathed rapidly, and on further effort there was distinct stridor, evidently arising in the trachea.

On laryngoscopic examination the larynx was normal, the vocal cords moved well, and there could be seen about the level of the third ring a pale projection from the left side, and to the extreme right a dark irregular aperture, evidently the altered lumen of the trachea. This was only visible occasionally. Externally the trachea was irregular, being somewhat depressed on the left side, and slightly prominent on the right.

A diagnosis of rupture of the trachea was made, but whether the stenosis was due to contraction of a wound in the mucous membrane only, or whether it involved the trachea, remained doubtful. The depression on the left pointed to injury of the cartilage.

As the man was unable to take any exertion without difficulty of breathing, he was advised to submit to an operation, with a view of removing the obstruction. He took some time to make up his mind, and it was not until February of the following year that the operation was performed. There had been no increase in the symptoms during the previous month, so that the stenosis had probably become stationary three months after the accident.

On dividing the trachea in the median line the bulging from the left side was confirmed. The third and fourth rings were injured. One of them was broken and bent inwards. They had been also separated, so that the trachea appeared somewhat lengthened on this side, and sharply bent inwards. The mucous membrane had evidently been ruptured, but was soundly healed. The deformity was partly corrected by removing a part of the cartilage, and sewing the adjoining rings together. At the same time the sutures were so placed as to avert as much as possible the indented wall. The trachea was not closed. The wound was covered with gauze; a tube was not used.

He made a rapid recovery, and has not suffered from any inconvenience since.

A Case of Obscure Ulceration of the Left Vocal Cord for Nearly One and a half Years' Standing in a Gentleman Aged 60.

Shown by SIR FELIX SEMON. The patient, a very thin and unhealthy-looking gentleman, aged about 60, was sent by Dr. Buckell, of Chichester, on June 14th, 1902, on account of hoarseness, which was found to be due to isolated congestion of the left vocal cord. Careful examination of the chest failed to reveal any tuberculous mischief, and there was no history of syphilis. Complete rest of voice was recommended, and a general tonic, together with benzoic acid lozenges. When seen again six weeks later, the congestion of the left vocal cord was distinctly diminished, and his general health improved. He went to Switzerland, and was further benefitted, but when seen again at the beginning of September the left vocal cord was found in part ulcerated, and in part tumefied. The ulceration occupied the middle part of the left vocal cord, and the tumefaction surrounded it on all sides. At the same time the mobility of the cord was quite preserved. Althought syphilis seemed to be practically excluded by the patient's previous history, which was intimately

known by Dr. Buckell and Dr. Thomas Wingrave, who on the occasion just named, and later on, used to accompany the patient, he was given iodide of potassium in ten-grain doses. His expectoration was repeatedly examined by Mr. Shattock for tubercle bacilli and for epithelial fragments, and his weight and temperature were carefully registered by Dr. Buckell. The result of all these examinations was absolutely negative. From that time onwards the case had become more and more obscure. Temporary improvements alternated with aggravations of the hoarseness, and also of general sensations of pain and discomfort in the throat and all round the neck, of which the patient had complained from the very first. The left vocal cord was sometimes more, sometimes less tumefied, and always ulcerated, but the ulceration did not show any tendency to extend further than when first seen: the tumefaction in its neighborhood had always remained on a very limited scale, and the mobility had throughout remained perfectly free. On more than one occasion slight enlargement of the cervical lymphatic glands on both sides of the neck had been observed, but this had always disappeared. The patient had been seen on various occasions by Mr. Butlin, and by Mr. Charters Symonds, who had entertained the same suspicions towards which he had leaned, viz. that the ulceration was either tuberculous or malignant, more likely the former; but the absence of any further developments, and of any demonstrable signs of either lesion, had not confirmed our fears. The Society would in all probability find the patient extremely ill-looking, and there was no doubt he was, but he was not one whit more so than when first seen, nineteen months ago, and he had ever since been able to fulfil the duties imposed upon him by his connection with many benevolent associations in addition to the cares of his own business. Dr. Wingrave, who had known him for twenty-five years, told him that his appearance had always been the same, that his weight had never been more than 8 stone 6 pounds, and that he and his family had always been extremely neurotic.

In the whole of his practice he only remembered one single case, which ultimately turned out to be epitheliomatous, in which an ulceration and tumefaction of a vocal cord of an obscure nature had remained so long stationary as in this case. In the early stages of his affection the possibility of anthrax was mentioned, as he was a wool merchant; but there had been nothing in the case, then and since, to justify that suspicion. He should much like to hear the views of the Society as to the diagnosis in this case.

The CHAIRMAN had seen the man some time ago, and the condition to-day was very much like what it was then. It struck him that the surface was a little less prominent and a little smoother.

DR. SCANES SPICER said it appeared to him the fleshy condition of the left cord (which was not now at all paretic) was due to small masses allied to vascular fibroma, and that the condition was not of a malignant nature.

DR. HERBERT TILLEY thought that the granular congestion of the freely movable cord was in favor of chronic tuberculosis, and this

even in spite of the fact that no tubercle bacilli could be found in the sputum. Chronic fibroid tuberculosis in old people was often unaccompanied by any active symptoms for long periods of time.

DR. BEALE agreed with the view taken by Dr. Tilley. He had seen cases (and watched them) of chronic tubercular disease of the lung where similar fleshy masses had been present. They were limited to one side and superficial, and had the curious vascular appearance that was seen in this case. He had not seen these cases very frequently, but he thought this was the nature of Sir Felix Semon's case. They did not interfere with the movement at all.

DR. LAW said that in comparison with the growth in the case shown by Dr. StClair Thomson, so far as he could see, this appeared a more isolated growth, and not a tuberculous infiltration. This growth, he thought, was possibly vascular.

SIR FELIX SEMON, in reply, said that, whilst thanking the various speakers for their suggestions, he was afraid that not much fresh light had been shed upon the case. Personally, he was inclined to believe that the ultimate solution would be found in chronic tuberculosis.

A Case of Epithelioma of the Larynx, Twice Operated Upon by Thyrotomy and Resection of the Crico-thyroid Membrane.

Shown by SIR FELIX SEMON. The patient, a gentleman, aged 58, who had been suffering for a long time from albuminuria and chronic bronchial catarrh, and had, after a fresh attack of bronchitis several months before, become completely aphonic. Examination of the larynx proved extremely difficult, and only after repeated efforts was it seen on the next day that on the front part of both vocal cords there were irregular nodular whitish outgrowths, not big, each being about the size of a half a pea. The whole, however, made more the impression of a malignant growth than of a papilloma. The growths were so small that the hoarseness seemed quite out of proportion to their size. It was extremely difficult to make out any further details, as the view into the larynx was always only a matter of a second, whilst he was catching his breath. Seeing his age, the probability of the growth being malignant seemed greater than that of simple papilloma; but whatever the growth, it seemed clear that external operation would be unavoidable in view of the unusual difficulties owing to the anatomical configuration of the larynx. The patient was advised to that effect, but it was proposed that he should see either Mr. Butlin, or, as he was about to go to Edinburgh, Dr. McBride, the President of this Society.

The patient not only followed this advice, and saw Mr. Butlin but when he had obtained an opinion from him similar to his own (Sir F. Semon's), went and saw Dr. Greville MacDonald, who very kindly wrote on May 29th that he had expressed his opinion somewhat diffidently as to the nature of the case, and had very strongly advised an intra-laryngeal operation for the sake of substantiating the diagnosis. This view was also taken by Mr. Charters Symonds, who was more hopeful than Dr. MacDonald that the disease might

possibly be benign. Dr. MacDonald then removed a piece of the growth intra-laryngeally on May 25th, which on microscopic examination was found to be a typical epithelioma.

Before performing a radical operation the patient was sent, in view of his chronic and considerable albuminuria, to Sir William Broadbent, who wrote that he did not think that the albuminuria would be a bar to the operation, in view of the high specific gravity of the urine, and in view of the fact that the renal affection had not interfered with tissue nutrition, since he gained a stone in weight at Cannes, and in view of the fact that there was no serious arterial degeneration.

Thyrotomy was performed on June 14th of this year, when the affection was found to be much more extensive than any of those who had seen the patient had anticipated. The whole anterior and lateral walls of the larynx in the region of the vocal cords was one mass of disease; the vocal cords were involved in by far the greater part of their length, particularly the right one, where the disease extended nearly to the arytænoid cartilage, and also implicated the ventricle of Morgagni. The left vocal cord was found to be affected in its entire anterior half; the disease extended to a considerable distance into the subglottic cavity, and had already perforated the crico-thyroid membrane in the shape of two or three little knobs in front of that structure. On the other hand, the thyroid cartilage was fortunately found not to have become involved on either side, and it was possible to strip off the diseased mass on both sides. The cartilage appeared white and glistening. The basis was well scraped, and the crico-thyroid membrane removed *in toto*. The patient bore the operation, which lasted nearly two hours, very well, except that the breathing at various stages of the operation was very curious, sometimes extremely intense, and at others very shallow, and again recalling the Cheyne-Stokes type.

The patient made a good recovery, and left the home about three weeks after the operation with the wound almost entirely closed, except in the middle part, where a small opening still remained. His albuminuria had greatly decreased, and the bronchial catarrh, from which previous to the operation he had considerably suffered, had much diminished. The last time he was examined before leaving was about 3½ weeks after operation, when the large internal wound was seen to be freely granulating, and there was apparently no recurrence of the disease.

The growth removed was submitted to Mr. Shattock for microscopic examination. His report completely corroborated the diagnosis made after Dr. MacDonald's intra-laryngeal operation, viz., that the growth was a squamous-celled carcinoma.

On August 10th he received a letter from the patient, dated from Blair Atholl, telling him that during the last few days he had been suffering from increasing breathlessness, which had at times been rather threatening.

The patient only came to town after the difficulty in breathing had further increased, on September 1st. He then saw Mr. Ewen Stabb, who had kindly assisted at the operation. Mr. Stabb reported that

there was distinct inspiratory stridor, increased on exertion, and that externally there was nothing to be seen or felt. Laryngoscopic examination was most difficult, but a distinct greyish mass of apparently granulation tissue was seen in front, and on the left side projecting into the lumen of the larynx. As the dyspnœa increased Mr. Stabb saw the patient in consultation with Mr. Butlin on September 19th, when there was no doubt that the condition, which had altered very much, represented recurrence of the disease. The surface was now warty, and the growth more extensive.

On September 21st Mr. Stabb reopened the wound. He first introduced a Hahn's tube, and then reopened the thyroid cartilage in the middle line. It was then seen that there was recurrence on both sides of the middle line in front. The growth was more extensive on the left side, and distinctly limited in its area, the attachment almost pedunculated. The posterior portion of the larynx appeared quite healthy. The center of the attachment corresponded to where the crico-thyroid membrane had been. Mr. Stabb first cleared out the whole of the soft parts completely except a strip of mucous membrane about half an inch wide on the posterior wall, then on each side he separated the soft parts from the cartilage, keeping well away from the latter, and finally removed on each side a U-shaped portion of the laryngeal framework, including the lower part of the thyroid alæ and the anterior half or more of the cricoid cartilage, and a small portion of the upper part of the trachea. It appeared to him, and to Mr. Waggett, that nothing would be gained by removal of the whole larynx, the upper part of which was seen to be perfectly healthy. As he included in the parts removed the soft parts outside where the crico-thyroid membrane had been, there seemed justified hope that everything diseased had been exterminated. The patient made a good recovery, and had so far remained free from fresh recurrence. The growth removed at the second operation was examined by Mr. Shattock, and was found to be in every respect similar to that removed on the first occasion.

Remarks.—The case is noteworthy from more than one point of view.

1. In the first place it showed that chronic albuminuria and bronchial catarrh were not necessarily contra-indications to radical operations of this kind.

2. Although he was quite accustomed to find the disease much more extensive on opening the larynx than it appeared from laryngoscopic examination, he frankly confessed that he had not the remotest idea of the enormous extent of the disease in this case, and his surprise on discovering it was shared by Mr. Butlin and Dr. Greville MacDonald when he communicated to them the facts ascertained during operation.

3. At the time of the first operation he entertained, as stated, fears as to recurrence, owing to the wide extent of the disease; but he certainly should not have expected such recurrence to take place in the very region in which he had most energetically removed everything that appeared to be diseased, viz., in that of the crico-thyroid membrane. In this respect the case taught again the well-known lesson

that, if once the disease had got outside the precincts proper of the larynx, the danger of recurrence was much greater than if it was still confined to them.

4. The present result illustrated the fact that even under such circumstances one ought not to despair, but try to improve by further operation, the extent of which would, of course, in each case vary with the particular requirements, the result of the first interference.

He should consider it his duty to report at some future time the further progress of this case, the more so as the danger of renewed recurrence was of course by no means over.

Case of Complete Nasal Obstruction of the Right Side Due to Chronic Dental Abscess Arising from Root of Incisor Tooth, and Forming an External Fluctuating Swelling Below Right Nasal Bone. Two Years' Duration.

Shown by DR. HERBERT TILLEY. Patient was a man æt. 34 years. Two years ago he complained of complete nasal obstruction on the right side, with some swelling on the outer side of the nose. It caused no pain. The galvano-cautery was applied to the anterior end of the right inferior turbinal on two or three occasions, but without any improvement.

When first seen on November 10th the entrance to the right nasal cavity was seen to be filled by a fleshy, congested mass, resembling in its contour a much enlarged anterior termination of the inferior turbinal body; but it was more resistent than the latter, and did not appreciably diminish under the influence of a 20 per cent. solution of cocaine. An adhesion bound it to nasal septum. The external swelling fluctuated, but was not congested nor painful, and its edges "crackled" on deep pressure. Puncture of the swelling internally by means of a hollow needle was followed by a discharge of dark serous fluid containing cholesterin crystals.

The right incisor teeth were both "dead," and over the buried root of the outer one a small suppurating fistula leading towards the apex of the root was found. Under general anæsthesia the anterior end of the right inferior turbinal was removed, and also the incisor teeth. A probe could then be passed through the socket of the outer root, and made to project just below the right nasal bone.

The patient made an uninterrupted recovery.

(To be continued.)

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SELECTED ABSTRACTS.

Paraffin as a Cosmetic Remedy.—Dr. Julius Schleifstein, Warsaw—*Archiv f. Laryngol.* Band xiv Heft 3.

After a brief rehearsal of the history of the use of paraffin in prosthesis, the author makes a pretty full statement of the accidents that have attended its use. On the basis of reported cases and some experiments made by himself, he comes to the following conclusions:

1. Paraffin, both hard and soft, is well suited for prosthesis, and does not have any bad effect upon the animal organism.

2. The loss of hair noticed in animals (mentioned also by Meyer) only takes place when the paraffin has been injected under tense membrane, or in too great quantity, which interferes with the nourishment of the membrane.

3. This is also the cause of the local gangrene and the refusal of the injection wound to close, and not the consistence of the paraffin, as Stein asserts, for soft paraffin may bring about similar complications.

4. In the course of time the injected paraffin becomes permeated by a compact connective tissue. This does not at all interfere with the action of the paraffin.

5. In comparison with the softer forms, a hard paraffin (melting at 54°, or even harder, according to Eckstein) does not cause especial disturbances in man or beast, except, perhaps, a slightly more energetic local reaction. It is therefore in certain human diseases less dangerous than paraffin melting at 36° to 42°.

6. In places where long and accurate pressure on the surrounding tissues cannot be maintained during the injection it is my opinion that the hardest paraffin should be used, because it hardens more rapidly and is less likely to cause thrombosis.

7. As a curative remedy, for instance, in such cases as incontinence of urine or feces, nasal enunciation, etc., it is perfectly justifiable to make a prosthetic use of paraffin, particularly as the cases of thrombosis reported in medical literature have had a favorable termination.

8. For purely cosmetic purposes paraffin must be regarded as a remedy not entirely devoid of danger, and should be used only in cases of extreme disfigurement or on demand of the patient.

VITTUM.

The Relation of Granular and Lateral Pharyngitis to Tuberculosis.—DR. R. SOKOLOWSKY—*Archiv f. Laryngol.* Band xiv Heft 3.

Stimulated by the controversy as to whether Waldeyer's ring exercises an alexeteric function or whether its epithelium, saturated with innumerable leucocytes, affords an open port to various infectious germs, Sokolowsky undertook the examination of a number of cases suffering from one or the other forms of disease mentioned in the title.

His material consisted of 34 cases, in 8 of which tuberculous tissue was found. He calls only those cases tubercular where there were present both typical tubercles with central cheesy degeneration and Langhan's giant cells. He found no bacilli in those slides which he stained for bacilli, but from this only argues the rarity of bacilli in these tissues. In all the cases there was tubercular disease or lupus present in some other portion of the body. In one case the examination of the pieces of mucous membrane removed for the purpose led to the discovery of a beginning pulmonary tuberculosis. While the whole matter may not be of the greatest importance, as tuberculosis of these structures always seems to be of a latent form, yet the author closes with the following postulates:

1. Lateral or granular pharyngitis is frequently of a tubercular nature in those cases where the organism is elsewhere invaded by tuberculosis or lupus.

2. The tuberculosis of the lateral columns or granules is in the "latent" form.

3. The extirpation of the lateral columns and granulations might in some cases be of diagnostic value, and in others have a certain prophylactic and therapeutic worth. VITTUM.

Some Improvements in the Method of Local Analgesia.—ARTHUR E. J. BARKER, F. R. C. S., Eng.—*The Lancet*, July 25, 9103.

Several points must be borne in mind, among them the mechanical and physical difficulties in infiltrating all the nerves supplying an extensive field of operation. To inject the whole area so as to reach all its nerves would mean in many cases the use of much more of the toxic drug than is necessary, and in some cases so much as to be dangerous.

The author refers to certain observations by Braun, of Leipsic, on a method of overcoming the drawbacks incident to the usual mode of producing local anæsthesia. This method is based upon the old experience that anything which retards or diminishes the circulation of the blood in a part enhances the potency of the analgesic agent. Experiments were made with adrenalin, a very small quantity of which was injected with B-eucaine (or cocaine) into the author's own arm, and subsequently into the arms of numerous patients. After the lapse of twenty minutes the part was quite blanched and wholly insensitive to pain, remaining so for about two hours. Adrenalin, alone, used in this way had no analgesic effect, while the results of the use of the combined solutions of B-eucaine and Adrenalin were far superior to those produced by B-eucaine alone.

The most convenient way to prepare the solution is as follows: Powders each containing 0.2 gramme (3 grains) of B-eucaine and 0.8 gramme (12 grains) of pure sodium chloride are kept in thick glazed paper, ready for use. When needed one powder is dissolved in 100 c.c. (3 1-2 fluid ounces) of boiling distilled water, and 1 c.c. of Parke, Davis & Co.'s Solution Adrenalin Chloride is added when the fluid is cool. The solution is left in the Jena glass beaker in which it has been boiled, which is carefully covered and placed in a vessel of warm water to keep it at blood heat.

The injection is made by means of a simple syringe of glass and metal of 10 c.c. capacity, with rubber washers, which can be sterilized by boiling.

To illustrate his method the author describes in detail the performance of an operation for the radical cure of inguinal hernia. The hernia is first reduced and the index finger is thrust into the external ring as far as possible. Along this finger the needle is entered and the inguinal canal is filled with 10 c.c. of the solution. An endeavor is made to inject it all around the neck of the sac so as to reach the genital branch of the genito-crural nerve. The needle is then entered at the external end of the line of incision in the skin, and is made to infiltrate the superficial layers of the latter down to the root of the scrotum, making the resulting wheal at least an inch longer at each end than the incision is to be. Injections are then made at a point half an inch to the inner side of the anterior superior spine of the ilium, the needle being thrust towards the ilio-inguinal nerve, and at a point about one inch above the middle of Poupart's ligament, where the ilio-hypogastric nerve is most conveniently met. Then the thigh is flexed and another syringeful is in-

jected along the ramus of the pubis and the root of the scrotum or labium.

It is necessary to wait twenty minutes after the last injection for the full effect of the Adrenalin to develop. The whole field of operation should be blanched and insensitive to pricks, but not to touch —analgesic, not anæsthesia. The incision may then be made with confidence that no pain will be felt. The absence of oozing of blood is noticed. Only large vessels bleed at all.

Success depends upon a mastery of the principles, and practice in the details of the method. It is not enough to inject the fluid under the skin generally. Due regard must be had to the position and course of the nerves supplying the structures to be dealt with. The Adrenalin compound, by slowing the circulation through the part prevents the anæsthetic agent from being rapidly washed away. The writer has used this method in thirty operations, including the radical cure of hernia, strangulated hernia, orchidectomy, removal of varicose veins, psoas abscess, loose body in knee, tumor of neck (actinomycosis), colotomy, Thiersch skin grafting, and cystic adenoma of the thyroid.

W. SCHEPPEGRELL.

Intubation of the Larynx and Intubation Instruments.—F. E. WAXAM (Denver)—*Colorado Medical Journel,* Sept., 1903.

"Ever since the time of O'Dwyer," says the author, "others have attempted improvements upon his instruments and methods, without bestowing upon them a thousandth part of the careful, painstaking and scientific investigation that characterizes the work of the great genius." Waxham having been identified with O'Dwyer in the early development of intubation and knowing well of his careful methods, says, 'I can imagine what his indignation would be, could he but know the alterations that have been made and claimed as improvements.'"

Possibly, as Dr. M. Nicoll has pointed out (Archives of Pediatrics, June, 1902), the faults of construction may be largely due to the fact that, as the result of the use of antitoxin, the tubes can be earlier dispensed with, and accidents, reintroductions and ulcerations do not as frequently occur as in former times. Consequently, any tube that can be introduced and retained for two or three days, no matter what the shape, no matter how faulty the construction, will often tide over the danger period and save a life. He, however, who would meet with greatest success, and save the very largest percentage of cases, must still observe the rules of construction so carefully laid down by Dr. O'Dwyer. Numerous illustrations of the original O'Dwyer instruments and their substitutes are given for comparison, and also the author's set of instruments more or less modified.

EATON.

BOOK REVIEWS.

The Practical Medical Series of Year Books. Vol. II., General Surgery. Edited by John B. Murphy, M. D., Professor of Surgery, Northwestern University Medical School. Published by The Year Book Co., Publishers, 40 Dearborn St., Chicago. Nov., 1903. 534 pages. Price, $1.50.

Thus is another valuable addition made to the practical series, and one which will delight the specialist and busy practitioners. Only the well founded and practical methods are rehearsed and the author's personal remarks and suggestions enhance its value very much. F. R.

Diseases of the Eye. By L. Webster Fox, A. M., M. D., Professor of Ophthalmology in the Medico-Chirurgical College of Philadelphia; Ophthalmic Surgeon in the Medico-Chirurgical Hospital. With five colored plates and 296 illustrations in the text; 566 pages. Cloth bound. D. Appleton & Company, Publishers.

This is a carefully prepared volume. The first chapter begins with the Embryological development of the eye, the second, its anatomy and the following nineteen are devoted to instruction upon the respective parts of the organ, and its many diseases. It is all in all a very complete text, and will be welcomed alike by instructors, practitioners and students. M. A. G.

Atti della Clinica Oto-Rino-Laringoiatra della R. Universita di Roma, diretta dal Prof. Gherado Ferreri. (Reports of the Throat and Ear Clinic in the Royal University of Rome, directed by Prof. G. Ferreri. Anno. I.—1903. Roma: Tipografia del Campidoglio, 5 Via delle Tre Pile. 1903.

In succeeding to the chair of Otology and Laryngology in the University of Rome our Italian collaborator has initiated a series of annual reports, comprising not only a record of the work done in the clinic, but also communications, researches, and theses by the students and assistants. The first volume contains original work on such subjects as the diagnostic value of lumbar puncture, the anatomy of the frontal sinus, the pathology of chronic purulent otitis media, etc. In future volumes we are promised a summary of Italian literature bearing on our specialty. This work is one more proof of the rapid progress being made in medicine by our Italian colleagues, and we congratulate Prof. Ferreri on its inception. StC. T.

The American Year-Book of Medicine and Surgery for 1904 (Surgery). A Yearly Digest of Scientific Progress and Authoritative Opinion in all branches of Medicine and Surgery, drawn from journals, monographs, and text-books of the leading American and foreign authors and investigators. Arranged, with critical editorial comments, by eminent American specialists, under the editorial charge of George M. Gould, A.M., M.D. In two volumes. Volume I, including *General Medicine* Octavo, 673 pages, fully illustrated; Volume II, *General Surgery*. Octavo, 680 pages, fully illustrated. Philadelphia, New York, London: W. B. Saunders & Co., 1904. Per volume, Cloth, $3.00 net; Half Morocco, $3.75 net.

The American Year-Book of Medicine and Surgery continues to maintain its high place among works of its class. Such a distinguished corps of collaborators which the editor has enlisted as his assistants is sufficient guarantee that the essential points of progress are brought out, and the collaborators' notes and commentations are excellent. As in the 1903 edition, the chapter on Diseases of the Ear, Nose and Throat is edited by Drs. D. Braden Kyle and Geo. Fetterolf. The editors are to be congratulated for the continuance of the high standard of excellence of this work. M. A. G.